

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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Art. 115.

Two Hundred Twenty Six New Species—II *

by

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LAURACEAE

Cryptocarya intermedia Elm. n. sp.

A medium sized tree; stem 3 dm thick, 12 m high, terete, straight, buttressed at the base, chiefly branched toward the top; wood moderately hard, dingy white, yellow in the center, a trifle bitter, odorless; bark smooth and brown, rather thick; main branches ascending, the ultimate ones dark green and numerous; twigs angular and fluted along their sides, the young tips densely brown puberulent or pulverulent. Leaves also numerous, alternate, subchartaceous, glabrous except the larger nerves beneath, dull green on the shallowly conduplicate surface, paler green beneath, brown on both sides when dry, the acute to subcuneate apex recurved, base broadly cuneate to obtuse, the average blades 13 cm long by 4 cm wide at the middle, elongated or the smaller ones broadly lanceolate; midrib very prominent and reddish brown when dry, usually puberulent or glabrate, shallowly sunken along the upper surface; lateral nerves of 4 to 6 alternating pairs, very oblique and almost straight, tips disappearing, other-

Note,—Proof read by *Emma O. Elmer*.

* Continued from article 114.

wise like the midrib, cross bars few and relatively obscure, reticulations very fine and quite prominent under a lens from the nether side; petiole stout, 5 to 8 mm long, flat and shallowly grooved along the upper side, rusty tomentulose in the early state. Flowers not obtained. Infrutescence suberect, terminal or from the uppermost leaf axils, 1 to 2 dm long, paniculately branched; stalks on the dry specimens yellowish or grayish short tomentose, divaricately spreading, yellowish green when fresh, flexible, subterete; fruits few clustered toward the distal ends of the relatively short branchlets, shining dark green, subglobose or broadly ellipsoid, nearly 1.5 cm long, when dry almost black and appearing fine blistery, both the apex and the base grayish puberulent, usually 1-seeded; pedicels only a few mm long, subpersistent, densely hairy, stout.

Type specimen number 13648, A. D. E. Elmer, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered this perplexing species on a steep densely wooded incline at 3950 feet elevation of Duros peak. "Maligting-mota" in Manobo.

Related to my mount Apo *Cryptocarya calelanensis* and to my mount Giting-giting *Cryptocarya glauciphylla*; neither is it *Cryptocarya palawanensis* Merr.

***Cryptocarya laevigata* Elm. n. sp.**

A gnarly appearing tree; stem 5 dm thick, 10 m high, irregularly round, branched from below the middle; wood bitterish, isabellinus or dark oak color, murky dark brown toward the center; bark 2 cm thick, latericius except the smooth yellowish or grayish white and more or less densely lenticelled surface; main branches spreading, numerous rebranched, the ultimate ones green and ridged, the young tips brown puberulent at least when dry. Leaves pendant, shining lucid green on the upper surface and baked brown when dry, chalky white beneath even in the dry state, entire, numerous, alternate, glabrous, rigidly coriaceous, ovate to subelliptic, 14 cm long by one half as wide below the middle, apex very abruptly and narrowly acute, broadly ob-

tuse to rounded at the base; petiole glabrate when old, 1 cm long, flattened along the upper side and grayish; midrib very prominent and yellowish beneath, impressed along the upper surface, very dark brown and obscurely puberulent beneath when dry; lateral nerves 2 to 3 on each side, the basal pair arising 5 mm from the base and ascendingly curved clear into the upper one third, the other nerves alternating and arising from and above the middle, also ascendingly curved and extending into the apical region, all tips becoming obsolete, cross bars faint. Flowers not observed. Infrutescence terminal or from the uppermost leaf axils, 1 dm long more or less, erect or suberect, very rigid, the larger ones paniculately few branched, the smaller ones very short branched and appearing spicate; the stalks angular, stout, greenish when young, rusty tomentose but wholly glabrous when old; fruits few clustered toward the distal ends of the ultimate stalks, upon 3 mm long comparatively thick and similarly pubescent pedicels, subglaucous green, hard, smooth, subglobose, the larger ones 1.5 cm thick, the basal portion usually more pointed than toward the apex, 1-seeded, very numerous.

Type specimen number 13604, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Upon a stony ridge of woods or forests strung with rattans and other climbing species at 3500 feet altitude and situated between Duros and Cawilanan peaks. The native or Manobo name is "Bonay."

Apparently related to *Beilschmedia trinervia* Merr. from the lake Lanao region. *C. V. Piper's* number 294 from Cabadbaran is the same as the Lanao material. Our species does not extend below 3500 feet altitude in our locality and upon close examination there are evident a number of distinctive characters.

***Cryptocarya mindanaensis* Elm. n. sp.**

A middle sized tree; stem 7 m high, 2 dm thick, subterete; wood soft, yellowish white, light in weight, odorless and nearly tasteless; bark relatively thick, grayish brown

lenticelled when old, yellowish on the inner side; branches spreading, freely rebranched; the twigs green or yellowish green, brown when dry, the young portion rusty tomentose. Leaves coriaceous or subchartaceous, shining and darker green above, curing deep brown though lighter brown beneath, copious, alternate, ascending or horizontal, glabrous above, finely pubescent beneath, entire, base broadly obtuse or rounded, apex abruptly acute to acuminate or merely obtuse and recurved, elliptic or elliptically elongated, quite variable in size, averaging 1 dm long by 4.5 cm wide at or a trifle below the middle; midrib prominent and reddish brown tomentose beneath, sunken along the upper side; lateral nerves about 5 pairs, ascending and slightly curved, also prominent and similarly tomentose beneath, tips reticulately united, the few cross bars relatively conspicuous, the reticulations much more obscure; petiole subterete, 5 to 8 mm long, tomentose. Flowers not seen. Infrutescence terminal or from the uppermost leaf axils, ascending or erect, 1 dm long or less, the larger ones paniculately few branched from below the middle, frequently appearing spicate or nearly so, the stalks yellowish green, in the dry state covered with a reddish brown tomentum; fruits upon short hairy pedicels or sessile, short ellipsoid, shining dark green, 1.25 cm long, nearly 1 cm thick across the middle, at the base provided with a pubescent rim, exocarp thin, with a large single seed.

Type specimen number 13269, A. D. E. Elmer, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

In compact red ground of a forested ridge at 1000 feet above ocean level. "Biaon" is the Manobo native name.

Cryptocarya laurifolia (Blco.) Merr. or *Cryptocarya luzonensis* Vid. but our leaves are broader and more pubescent beneath and with very distinct cross bars.

***Litsea bicolor* Elm. n. sp.**

Only a small upright tree; stem crooked but terete, 15 cm thick, 8 m high, branched at the top; wood rather soft, slightly bitter, odorless, yellowish; bark testaceous except the

smooth and grayish mottled surface; main branches few, sparingly rebranched, long and very slender, spreading. Leaves in whorls 1.5 to 4 dm apart, mostly horizontal or descending, diverse in size, flat, subchartaceous, chalky white beneath except the dull yellow or fulvus midrib and lateral nerves, glabrous when old, sublucid above and grayish brown when dry, entire, broadly rounded and usually with a short blunt point at the apex, base broadly obtuse, elliptic or more commonly obovately elliptic, from 2 to 4 dm long without the stalk, 9 to 17 cm wide a trifle above the middle, the young leaves beneath brown hairy but soon becoming glabrous; midrib very stout beneath and in the early state dark tomentose, nearly flat on the upper side, brown on both sides; lateral nerves similar in color, about 9 on each side, ascending and gradually curved, relatively prominent on both sides, cross bars quite evident from beneath only, under a lens both surfaces but especially the upper side appearing very minutely reticulate; petiole 3 to 5 cm long, very thick and somewhat compressed, in the early state short fulvus tomentose, the upper side shallowly grooved and more nearly glabrous. Flowers not seen. Fruits clustered along the branchlets, upon short woody tubercles, ellipsoid, 1.25 to 2.25 cm long, turning from green to yellow and finally deep vermillion red; cups 1 to 1.25 cm across, flat, greenish, glabrous, persistent, constricted at the base, upon short and thick pedicels.

Type specimen number 13961, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected in humus covered soil among stones of deep woods in the Catangan creek gulch at 3000 feet above sea level. The Manobo name is "Hannag."

***Litsea macrophylla* Elm. n. sp.**

A rather small and widely spreading tree; stem subterete, 4.5 dm thick, crooked, 12 m high, buttressed at the base, branched toward the top; wood very soft, without odor or taste, dingy or yellowish white except the musty nearly black central portion; bark thick, dark brown, densely len-

ticelled; limbs divaricately spreading, the basal ones long, sparingly rebranched, those toward the top rebranched; twigs thick and greenish, chain-like marked, glabrous. Leaves ascending, conduplicate, the obtusely rounded apex only slightly recurved, subglaucous green beneath, when dry even more white, the upper side curing brownish, a trifle inequilateral but the base very obliquely so, ovately elongated, 5 dm long by 2 dm wide below the middle, glabrous, the entire margins subinvolute in the dry state; midrib yellowish green, also glabrous, flat above, strongly raised beneath, turning black while drying; lateral nerves 19 to 23 pairs, pinnate, tips strongly ascending and almost disappearing, those of the upper nerves interarching, the minute reticulations obscure; petiole nearly 1 cm wide, black when dry, 1.5 cm from the base to the leaf base along one side, twice as long along the other side. Flowers not seen. Fruits densely clustered along the larger branches; stalks varying from 3 to 8 cm long, rigid, glabrous, greenish in the fresh state, bearing few fruits toward the distal ends; calyx cup shining deep green, constricted below the middle, subsessile, irregularly round, when dry radially rugose, margins appearing crenate, 2 cm across; nuts flatly globose, greenish white, becoming a trifle thicker than the calyx, shining and glabrous.

Type specimen number 13316, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Collected in rich soil of damp secondary forests at 500 feet altitude and near my headquarters. The Manobos called it "Pepay."

Distinguished from *Litsea gigantifolia* Merr. by having still larger leaves whose nether side is chalky white instead of yellowish, lateral nerves farther apart, widest below the middle, with an inequilateral oblique base, apex obtusely rounded not acute to acuminate.

***Litsea urdanetensis* Elm. n. sp.**

Also a middle sized tree; stem nearly 6 dm thick, terete but somewhat crooked, 13 m high, chiefly branched toward the top, nearly straight; wood yellowish, slightly bit-

ter, odorless, soft, only the thin sapwood whitish; bark thick, gray and brown mottled, smooth, flavus except the epidermis; branches spreading, crookedly rebranched, the ultimate ones slender and green, glabrous, striate, black when dry. Leaves alternate, ascending or horizontal, nearly flat, entire or margins coarsely wavy especially toward the bluntly pointed acute to obtuse apex, broadly cuneate toward the obtuse base, glabrous, elongated, thinly chartaceous, subglaucous green beneath, averaging 3 dm long by 1 dm wide across the middle or the widest portion, curing unequally green on the 2 sides; midrib ridged beneath, yellowish green yet nearly black in the dry state, plane and brown on the upper side; lateral nerves of 14 to 19 pinnate pairs, similar in color when fresh and when dry, less prominent than the midrib, tips ascendingly curved and gradually disappearing, cross bars faint, reticulations numerous and quite evident from both sides under a lens; petiole also glabrous, ascendingly curved, yellowish green, pure black when dry, subterete, narrowly grooved on the upper side, 1.75 cm long. Flowers solitary or 2 to 3-clustered, mainly from the leaf axils; peduncle about 1.25 cm long, ascending, yellowish green, puberulent, subtended by bract vestiges; buds globose, ashy gray; involucral bract thickly coriaceous, deeply concave on the upper side, glabrous, 5 to 7 mm long, about 5 mm wide across the middle, broadly elliptic, pulverulent or puberulent on the exterior, severally nerved, broadly rounded at the apex, spreading in full anthesis; flowers faintly odorous, few to 5-grouped in each head, also spreading; pedicel comparatively thick, 3 mm long, finely pubescent; perianth 3 mm long, 1 mm wide, narrowly oblong, membranous, glabrate and densely punctate, 7 or more in number, divaricate and wrinkled; fertile stamens about 8 or 9, with apparently 3 much shorter and sterile ones; filaments of the longer stamens filiform, strigose, curvingly spreading, 3 mm long, alternating with the perianth segments; anthers basifixed, introrse, 0.25 mm long, 0.6 mm wide, truncate at both ends, flattened, the 2 pairs of anther cells lateral and closed over with hanging lids, ovate to obovately oblong; style few mm long, thick, glabrous, bearing a capitate stigma.

Type specimen number 13427, *A. D. E. Elmer*, Cabad-

baran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Collected in a wet forested flat at 500 feet above the sea. The Manobo vernacular name is "Dila-maok."

Critically related to *Litsea albayana* Vid., *Litsea oblongifolia* Merr. and *Litsea ceasifolia* Elm.

***Litsea velutina* Elm. n. sp.**

Quite a good sized tree; trunk 5 dm thick, terete, crooked, 14 m high, its first branches a little above the middle; wood soft, yellowish, odorless and tasteless, light in specific gravity; bark thick, smooth and dull brown on the surface, testaceous otherwise; main branches ascending and widely spreading, ultimately freely rebranched; branchlets dark brown, ascending, more or less angular and striate, dark brown puberulent. Leaves copious, persistent, opposite or subopposite, mostly horizontally spreading, coriaceous or subchartaceous, flat, shining deep green on the upper surface, paler or subglaucous green beneath, curing dark brown on the upper glabrous side, much lighter brown on the nether or subvelutinous side, very smooth, apex acute, base broadly obtuse, ovately elliptic or subelliptic, the velutinous brown covering on the under side disappearing in the old leaves and becoming chalky white beneath, the entire edges subinvolute in the dry state, the average ones 10 to 12 cm long and 4 to 5 cm wide across the middle or a trifle below it; midrib nearly flat above, light brown velvety covered in the early state, soon wearing glabrous, very prominent beneath; lateral nerves pinnate, parallel, almost straight, tips ascendingly curved and gradually disappearing, suboblique, cross bars rather numerous and relatively faint; petiole 5 to 8 mm long, drying blackish brown, pulverulent, thick especially toward the ascendingly curved base. Young inflorescence glomerated from the leaf axils, scarcely longer than 1 cm; bud pedicels 2 mm long, relatively very thick, deep rufus pubescent; involucral bracts 4, in 2 opposite pairs; the outer pair larger, arching over the inner pair though alternate with it, 2 mm long, short rufus pubescent on the exterior, spoon shaped, broadly oblong or ellip-

tic, very thick and rigid; the inner pair also pubescent on the exposed surface, all 4 more or less united at the base; young flower clusters in 4, pubescent. Infrutescence from the axils of the leaf scars along the branchlets, ascending, few clustered, stalks very thick and short; fruiting cup green, 1 cm across the truncate apex, the same in length, stipitate at the base; young nuts darker green and with minute milk spots, when fully mature dark or deep red and shining, short ellipsoid, 1 cm in length, 1-seeded.

Type specimen number 14189, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered this very distinct *Litsea* in damp stony ground of a forested incline at 5250 feet altitude and on the general route from lake Danao to the summit region of mount Urdaneta. Only one tree was detected. Its Manobo name is "Sungsung."

***Persea pyriformis* Elm. n. sp.**

Only a small or middle sized tree; stem 3 dm thick, 8 m high, branched from the middle; wood soft and coarse, odorless and without taste, dingy white; bark thick, blackish brown on the densely checked epidermis, the central portion brown, the inner side white; main branches widely spreading and ultimately freely rebranched; the twigs green and smooth, terete, turning almost black while drying, rather slender. Leaves descending, curvingly folded upon the upper darker green surface, thinly coriaceous, subglaucous green beneath, opposite or subopposite, glabrous, well scattered, exceedingly variable in size, the abruptly and sharply acute point recurved and frequently subfalcate, base broadly obtuse or rounded, entire margins subinvolute in the dry state, oblong or ovately oblong, 1 to 2 dm long by 4 to 9 cm wide at the middle; petiole 1 to 2 cm long, blackish brown, glabrous, caniculate, comparatively slender; midrib raised beneath, smooth, reddish brown when dry; lateral nerves 3 on each side whether of small or large blades, the basal pair arising 5 mm from the base and running nearly parallel with the leaf edge, the

others arising from above the middle, also much ascending, their tips more or less interarching, cross bars also evident, reticulations fine. Flowers not seen. Fruits upon 3 cm to 1.5 dm long stalks or spikes, from the leaf axils, usually solitary though occasionally few clustered toward the distal end, hard, shining green, elongated and pear shaped, 8 cm long and nearly one half as thick toward the distal end, terete, with a large similarly shaped yellowish seed; pedicels 1 cm long or shorter, thick, expanded at the end, subterete, subpersistent.

Type specimen number 13311, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Standing among dense woods on the gravelly banks of the Catangan creek at 1000 feet altitude. "Hotot" is the Manobo name.

***Persea surigaoensis* Elm. n. sp.**

A slender and erect tree; stem 2.5 dm thick, 10 m high, terete, mainly branched toward the top; wood odorless and without taste, soft, yellowish tinged except the light yellow heartwood; bark smooth, yellowish or gray toward the branches, lateritious except the surface; branches divaricate, rather long and crookedly rebranched towards their ends; the twigs glabrous, roughened with lenticels, subterete, ascendingly curved. Leaves alternate, chartaceous, ascending, glabrous, similarly brown on both sides when dry, entire, the nether side much lighter green in the fresh state, apex broadly rounded except the abruptly short acute and recurved point, base cuneate, obovately elongated, 3 to 4 dm long by 14 cm wide above the middle, frequently becoming much reduced; midrib very pronounced beneath, plane above, yellowish but brown when dry; lateral nerves very similar, composed of 11 to 13 pairs, ascending, nearly straight, tips of the upper ones much curved and interarching, the coarse cross bars relatively prominent, the secondary cross bars and intervening reticulations also evident; petiole about 2 cm long and 5 mm thick, terete, upwardly curved, glabrous. Panicle arising from the uppermost leaf

axils, erect, 1 to 2 dm long, when solitary branched from below the middle, or with 3 stalks from the base and of which the middle one is the longer; branches ascending alternate, green; bark turning reddish brown on the exposed side, in the dry state appearing compressed, rebranched from above the middle, the younger ones latericibus short tomentose; buds umbellately clustered toward the distal ends of the branchlets, subtended by small similarly tomentose and caducous bracts; flowers in anthesis ochroleucus, when old dull purpureus, all stages of development on the same inflorescence and thereby variously colored; strict pedicel 3 mm long, short fulvus pubescent, subtended by thick acute bracts covered with similar hairs; outer series of perianth segments 3, brown strigose on the outside, 1.5 mm long, ovate, clearly punctate, rigid; the inner series of 3 segments alternating with the outer series, all united, at the base broadly ovate, at least 2 mm long, less pubescent on the outside, also punctate; stamens apparently sterile, forming a thick cartilaginous more or less hairy rim; the sessile or nearly sessile anthers introrse, apparently minutely 4-celled; pistil well developed, 1.5 mm long, glabrous; ovary ovoidly ellipsoid, style very short, stigma expanded.

Type specimen number 14027, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Gathered in loose more or less stony ground deeply covered with humus of a densely shaded or forested depression along the Catangan creek at 3000 feet altitude. Only one tree was found and my Manobo cargadore called it "Pamoteon."

Only distantly related to my *Persea leytenensis* and it may possibly belong to the genus *Cryptocarya*. This same species has previously been collected at Placer and on Dinagat island of Surigao province by *Sr. J. F. Quadras* in the year of 1901. I was wrong in referring the Surigao specimens under *Persea leytenensis* *Elm.* on page 384 of this publication.

LECYTHIDACEAE

Barringtonia gitingense Elm. n. sp.

Slender erect tree; stem 2.5 dm thick, terete, branched above the middle; wood dirty yellow, odorless, bitterish, moderately hard and heavy; bark thick, dull gray, the epidermis scaling in relatively thick but small plates; branches gnarly, spreading, crookedly rebranched, the tough and glabrous twigs suberect. Leaves ascending, alternately crowded toward the ends of the branchlets, rigidly coriaceous, glabrous, sublucid on the upper folded surface, slightly recurved toward the acuminate point, the entire margins minutely involute, more or less wavy and curved upon the nether side, base subattenuate or cuneate, drying dull caesius, exceedingly variable in size, the average blades 2 dm long by 6 cm wide at the middle, occasionally larger, frequently much smaller, lanceolately oblong, leaving large conspicuous scars after falling; midvein pronounced beneath, finely ridged on the upper side; primary lateral nerves 9 to 13 pairs though frequently interspersed with secondary ones, divaricate, also prominent from both sides, their tips usually interarching and somewhat reticulately branched, reticulations numerous and bold from both surfaces; petiole glabrous, 5 to 8 cm long, angular and flattened on the upper side, thickened and blackish at the base in the dry state, brown when fresh; bud bract glabrous, acuminate, 7.5 mm long. Inflorescence terminal, pendulous, 1 m long or less; rachis tough, terete, glabrous, longitudinally striate, less than 1 cm thick, when dry much thinner, solitary; flowers deciduous, heavy, sessilely scattered along the spike, divaricate, with a faint disagreeable odor; calyx green, 1 cm long, the basal one half or more angular and gradually thickened toward the top; segments persistent, 4, broadly rounded or obtuse; petals of the same number, caducous, greenish white, succulent, oblong, 2.5 cm long, nearly 1 cm wide, glabrous; filaments yellowish white, very numerous, the basal portion straight and at the base united and adnate upon the corolla, pur-

lish red toward the apex and interlaced, 3 to 4 cm long; anther yellow, ovately ellipsoid, 1 mm long; style persistent, reddish except the greenish basal portion, filiform, much exceeding the stamens and usually recurved; stigma slightly enlarged, green or greenish.

Type specimen number 12236, *A. D. E. Elmer*, Magalanes (Mt. Giting-giting), Island of Sibuyan, April, 1910.

Standing in good moist soil of woods or forests at 700 feet above sea level. The Visayan of northern Sibuyan call it "Magopaho."

This species was distributed as *Barringtonia revoluta* Merr. of Palawan and of which I more recently collected typical specimens in the type locality. It is distinctly different from *Merrill's* species and seems to run closely to *Barringtonia sumatrana* Miq.

LEGUMINOSAE

Dalbergia dubia Elm. n. sp.

A tough forest tree climber; stem 3.5 cm thick toward the rebranched top; branches wiry, brown and yellowish gray lenticelled; twigs relatively short, horizontally spreading, when young or along the lower or protected side densely testaceous puberulent, the older or more exposed portion smooth or glaucous gray. Leaves entire, alternating along the ultimate branches, subsessile or very short stalked, ascending, varying from 5 to 10 cm long, 15 to 31-imparipinnate; rachis subolivaceous tomentulose, leaflet bearing from near the base; leaflets also ascending, membranous, flat, paler green beneath, subopposite, oblong except the terminal one which is obovately elongated, curing lighter brown beneath, yellowish strigose on both sides especially on the lower side, varying from 1 to 2 cm in length and from 5 to 8 mm in width, truncately rounded and subemarginate at the apex, base obliquely rounded, inequilateral below the middle; midrib conspicuous beneath and olivaceous hairy, plane along the upper side, lateral nerves and minute reticulations obscure. Inflorescence paniculate, terminal, ascendingly curved, branchlets 6 to 9 cm long or much shorter,

relatively narrower across the base; main branches alternately branched from below the middle, short testaceous tomentose; their branchlets slender, unbranched, bearing flowers from near the base. Flowers yellowish green, caducous, quite rigid, buds green, all subtended by green and subpersistent bracts; pedicel nearly 2 mm long, pulverulent, subtended by a broadly rounded persistent puberulent bract; calyx 5 mm long, almost 3 mm thick toward the top, dark brown when dry, glabrous, at the base subtended by a pair of leathery broadly elliptic 2 mm long puberulent bracts, uniguely and bluntly 5-toothed across the truncate apex; petals glabrous, 7.5 mm long, very slenderly clawed below the middle, inserted upon the basal portion of the calyx; banner erect and much recurved, the lamina portion broad and irregularly 3-notched across the broad apex, truncate and subauriculate at the base, sides rolled upon the ventral surface; wings and keels not very unlike, the lamina portion oblong, with the widest portion toward the broadly rounded or subtruncate apex, at the base auriculately lobed, rather straight, like the banner more or less veiny; stamens 6 mm long, tubular, straight, 1.25 mm thick, entirely glabrous, 10-ridged, only the apical 1.5 mm long portion free and ascendingly curved; anthers very small, terminal, basifixed, apparently notched at both ends; stipe very slender, glabrous, 1 to 1.5 cm long; ovary about as long, 3 mm wide, very flat or rather thin, tapering toward the stipe, apex obtuse and terminated by the 1 mm long style, about 3-ovuled.

Type specimen number 13733, *A. D. E. Elmer*, Cadbadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

This liana was found on a wind swept forested ridge at 3500 feet of Duros peak. Manobos call it "Ticosmayadon."

Related to a number of species but especially to *Dalbergia pinnata* Lour. and to *Dalbergia tamarindifolia* Roxb. The former species *Dr. Col. Prain* in his monograph refers to *Dalbergia millettii* Benth.

***Derris surigaoensis* Elm. n. sp.**

A climbing and sprawling shrub; stem bendable, terete, 2.5 cm thick, chiefly branched at the top; wood white, very soft, odorless and without taste; bark smoothish, greenish brown, yellowish in the middle, nearly white on the inner side; branches green, light brown lenticelled, terete, glabrous, slender and dropping, the ultimate ones relatively short. Leaves alternate, horizontal, somewhat paler beneath, chartaceous when old, the abruptly acute to acuminate apex strongly recurved, drying light gray to brownish beneath and greenish on the upper side, glabrous, entire margins subinvolute in the dry state, obtusely rounded and occasionally slightly inequilateral at the base, elliptically elongated or suboblong, variable in size, the average blades 1 dm long by 4 cm wide at or above the base, 3 to 5-foliate, the terminal leaflet considerably larger; petiole with the rachis 1 dm long or longer, green, glabrous, subterete and minutely caniculate along the upper side, the petiole base much thickened and drying blackish brown, the rachis extended 1.25 to 2 cm beyond the upper pair of lateral leaflets; petiolule 4 to 7 mm long, thick, deep brown in the dry specimens; midrib stout beneath, little sunken along the upper surface, stramineous when dry; lateral nerves ascendingly curved, obscure, about 5 to 8 pairs, reticulations very fine, similarly prominent on both sides. Inflorescence suberect, terminal or subterminal, 1 to 4 dm long; branches alternate, few, rather slender, green and glabrous, spicate or with only very short lateral branchlets, striate or becoming angular, ascendingly curved; flower bearing branchlets alternately scattered from near the base, 1 to 2 cm long, slender; pedicels 5 mm long, few and alternately scattered from the middle, very slender, divaricate, subtended by bract vestiges, glabrate or only sparsely short hairy; calyx 3.5 mm long, as wide across the slightly obliquely truncate and minutely ciliate apex, rounded at the base, glabrous, longitudinally marked with whitish striae; banner 12.5 mm long, broad and truncately rounded at the lamina base and constricted into a 2 mm long narrow claw, the hyaline side folded and in the upper region with elongated spots, apex rounded

and shallowly emarginate, with numerous veins, 8 mm wide; wings 1 cm long, the basal 3 mm clawed, the lower side nearly straight and contiguous in the early state, the upper edge minutely undulate and lobulate at the base, rounded at the apex, veiny and with greenish elongated striae in the upper region, hyaline; keels as long, similar in texture and markings, the lower edge nearly straight and contiguous along the middle or above it, 3 mm wide, broadly rounded at the apex, the base of the lamina with a tooth-like lobe and with a 1.5 mm long claw, also veiny; stamens 1.25 cm long, 10, united into a glabrous tube 2 mm thick at the base and with an excrescence on the upper side near the base, the curved portion open; free portion of the filaments ascendingly curved, all glabrous; anthers broadly elliptic, 0.66 mm long, basifixed, laterally dehiscent; ovary 1.25 cm long, subcompressed, widest a trifle below the middle, strigose except the ascendingly curved glabrous neck; stigma minute.

Type specimen number 13493, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Covering dense thickets and woods on wet rocky banks of the Catangan creek at 1000 feet altitude. The Manobo name for it is "Bagodon-ihanon."

Not *Derris philippinensis* Merr. which is based upon 11262 Cuming. Neither is it Dr. Perkins' Philippine species *Derris mindorensis* or *Derris micans*.

***Cynometra copelandii* Elm. n. comb. *Gleditschia copelandii* Elm.** Leaf. Philip. Bot. II, 695, 1910.

***Cynometra whitfordii* Elm. n. sp.**

A very small and upright tree; stem terete, 1 dm thick, 5 m high, branched from below the middle; wood reddish brown, quite hard, odorless and tasteless; bark nearly smooth, atropurpureus except the mottled epidermis; branches divaricate, repeatedly branched and horizontally spreading; the ultimate ones crooked, relatively short, terete, rigid and tough, the young tips tawny puberulent though soon becoming glabrous. Leaves alternate, the terminal ones appearing op-

posite, bijugate and in the early state with a pair of small opposite pair of leaflets from the base; terminal pair of leaflets sessile, ascending, subchartaceous, much paler beneath, ultimately glabrous, the recurved apex abruptly acute to acuminate, at the blunt point deeply notched and its lobes rounded, obtuse at the base and inequilateral, oblong, equal in size and shape or only seldom unequal, the inner side narrower and straight toward the base, the average ones 1 dm long by 4 cm wide across the middle or its widest portion, entire, curing nearly equally brown on both sides; the basal pair of leaflets usually unequal in size, broadly elliptic, also sessile, 8 to 20 mm long, ultimately falling, rounded and oblique at the base, broadly obtuse and minutely notched at the apex, otherwise quite similar to the other pair of leaflets; midrib prominent beneath, usually with strigose hairs along its sides toward the base, plane above; lateral nerves subdivaricate or ascending and straight, 5 to 9 on each side and with intervening secondary ones, reticulately united toward their ends, reticulations quite evident from both sides; rachis 1 to 1.5 cm long, rather densely yellowish brown pubescent, caniculate along the upper side. Flowers in small groups, axillary or rather opposite the terminal leaf, erect, upon a short common stalk which is densely bracteate at the base; pedicel 1 mm thick, averaging 4 mm long, yellowish pubescent, strict, subtended by a whorl of deciduous bracts; outer bracts ovate, 2.5 mm long, as wide across the truncate base, strongly folded about the base of the pedicel, coriaceous or brown and subchartaceous in the dry state at least, 2-cleft, the acute apices terminating into subcallous points, finely puberulent on the dorsal side, the inner 2 bracts free or nearly so, almost 2 mm in length, strongly folded, oblong to broadly lanceolate, glabrous except the keel above the middle and along the margins; corolla spreading from the distal end of the pedicel, brown when dry, membranous, 2.5 mm long, irregularly divided but all of the 5 segments of equal length, glabrous, reflexed and persistent after anthesis, the broader one 2 mm wide and elliptically oblong, the narrower ones less than one half as wide and linear; stamens about 10, two thirds of them fertile, the others sterile; staminodes nearly 4 mm long, membra-

nous, lanceolate, 0.75 mm wide at the middle, sharply pointed at the apex, the midrib quite prominent and glabrous; filaments varying from 1.5 to 4 mm long, also glabrous, coriaceous, subterete, more erect than the spreading staminal nodes; anther 1 mm long, subbasifixed, compressed, ovately elliptic from the side view, notched at the apex, laterally dehiscent; ovary compressed, cuneate or short stipitate at the base, 2 mm long, the basal portion provided with long yellowish hairs, strongly bulged above the middle; style as long, terete, fleshy, glabrous, ascending, terminated by a minute stigma. Young pod erect, much compressed, rather thick and hard, lune shaped.

Type specimen number 13465, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Collected in very damp humus covered soil mixed with boulders of a densely forested flat near the Catangan creek at 1250 feet altitude. "Cato-cabinganan" is the Manobo name. Dedicated to *Dr. H. N. Whitford*, formerly economic and scientific forester of the Philippine government.

Clearly related to *Cynometra bijuga* Span and apparently distinct from its varieties.

***Mucuna macmillani* Elm. n. sp.**

A lofty tree climber or liana; stem 8 cm thick, terete, very crooked and twining, mainly branched toward the top; stem tissues nearly herbaceous, porous, divided into five reddish and five yellowish white alternating concentric zones, the reddish portion freely bleeding with an incarnatus or purpureus juice, quite odorless and tasteless; branches long and rope-like, hanging from the tree tops over the creek bed or spanning it entirely; the ultimate ones green, terete, glabrous, tough, drying brown and minutely striate. Leaves divaricate, widely scattering, alternate, trifoliate; petiole 1 dm long or less, glabrous, terete, the basal portion much thickened and twistingly curved, 3 cm extended beyond the lateral pair of leaflets, blackish brown in the dry state; petiolule 1 cm long, thick, black when dry, occasionally subglaucous and usually puberulent; the interstipular bracts

diverse, linear or laciniately lobed, those from the petiolules much reduced; lateral leaflets ovate in general outline, abruptly and narrowly acuminate, tips strongly recurved, base very broad and truncately rounded, quite unsymmetric, the outer side twice as broad as the nearly straight inner side and broadly rounded below and toward the base, mostly descending, coriaceous, paler green beneath, nearly flat, curing dark brown on both sides, glabrous, the larger ones 18 cm long by one half as wide below the middle, entire; the terminal leaflet symmetric, equal in size, base broadly obtuse to obtusely rounded; midrib conspicuous beneath, straight in the lateral leaflets; lateral nerves 5 to 7 pairs, plane above and like the midrib conspicuous beneath, ascending especially the basal pair, the outer basal nerve 3 to 5-branched along its lower side, the next above it fewer branched and the third one merely forked, cross bars few and faint. Peduncle green, thread-like or wiry, glabrous, quite strong and elastic, axillary, 3 to 7 m long, at the end corymbosely paniculate; branchlets 1 to 3 dm across, thick, alternately rebranched, the ultimate ones rather numerous, striate or roundly angular, short velvety brown tomentose, subtended by glabrous scars of fallen bracts; buds pale green or yellowish tinged, when dry appearing dark velvety, also short tomentose, ellipsoid, 1.5 cm long, one half as thick across the middle, the abruptly apical point tipped, sessile and solitary from the end of the compressed 1 to 1.5 cm long pedicel, subtended by a pair of bracts; caducous bracts leathery, 5 to 8 mm long, oblong, similarly tomentose; calyx a flattened cup, thick and rigid, on the outside densely covered with a velvety brown puberulence, 2 cm long, nearly as wide, the truncate throat somewhat oblique by the extension of the lower one half which usually bears 3 blunt points, the middle one of which is the largest; corolla fleshy, pale sulphureous when fresh, turning black while drying, glabrous; banner 4.5 cm long, auriculately constricted at the base into a 5 mm long claw, apex broadly rounded, the lamina elliptic and more or less folded upon the ventral side; the wings 7.5 cm long, the lamina 5.5 cm long by 1 cm wide at least, obtusely rounded at the apex, the basal 2 cm claw-like and dense

hairy upon the under side; keel as long as the wings, the distal 5 cm divided into 7.5 mm wide lobes of which the apical 1 cm is distinctly upwardly curved, obtusely terminated; stamens 9, about 4 cm long, glabrous, the basal two thirds united into a broad straight tube, the apical one third free and ascending; filament subequal in length, the upper ones longer, free toward the base, flattened; anthers basifixed or nearly so, the 2 lateral ones 3 mm long, 2 mm wide across the upper portion, notched or sinuately lobed at the hairy apex, base much narrower and obtuse; the other anthers glabrous, 1 mm longer, 1.5 mm wide throughout, emarginate at the apex, truncate at the base; ovary subterete, short velvety pubescent, 1.5 cm long; style very slender, glabrous, 4 cm long, the stigmatic portion thickened and terminated by an evident point.

Type specimen number 13594, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Discovered along the rocky forested banks of the Catangan creek at 1500 feet elevation. Named with pleasure after *Mr. Clyde MacMillan*, the supervising American teacher at Cabadbaran who has shown me many favors which were highly appreciated. The Monobos call it "Bunalan."

Chiefly differs from my number 6233 or the type of *Mucuna longipedunculata* Merr. in having only one half as large bracts which with the pedicels and calyces are more densely covered with a dark velvety brown tomentose not cinereous or subglabrous. There are other minor differences in the flowers and leaves.

Along this same creek in the densely forested flats there is another very distinct species of *Mucuna* which I failed to get even after making quite a clearing. Flowers of it were often seen on the ground and whose corollas were scarcely any longer than wide, were of the same creamy white color when fresh and turning deep black while withering and becoming dry.

***Strongylodon agusanensis* Elm. n. sp.**

A looping woody climber or liana; stems very flexible,

3 cm thick, subterete, twining and twisting, with very soft greenish wood and a large whitish pith; bark greenish and gray blotched, more or less brown lenticelled; twigs glabrous, terete, greenish but turning brown when dry, the slender ones hanging, tough. Leaves horizontal, alternately scattered; petiole ascendingly curved, also glabrous, similar in color to the twigs in the fresh as well as in the dry state, 9 to 13 cm long, subterete, curved and somewhat thickened at the base, subpersistent; petiolule darker green, 5 to 7 mm long, thick, grooved along the upper side, curing yellowish, articulate at the base and easily separating at that point, the petiole extended 6 mm above the lateral pair of leaflets; blades trifoliate, subcoriaceous, curing greenish to brown on both sides, entire, 10 to 14 cm long by one half as wide relatively; lateral pair very unequilateral, abruptly acute at the apex, base truncately rounded; the terminal leaflet symmetric, similar at the apex, broadly cuneate toward and at the basal point rounded; midrib glabrous, pronounced beneath, stramineous when dry, finely ridged along the upper side; lateral nerves 5 to 7 pairs, similar in prominence and color, ascending, nearly straight, tips strongly curved, basal pair of the terminal leaflet parallel with the edge of the leaf, cross bars evident, reticulations minute; stipules adnate, thick, oblongish, 5 mm long. Inflorescence lateral, divaricate; rigid spikes 5 to 20 cm long, subterete, glabrate, more or less striate and short bracteate at the base, flower bearing above the middle; very young apical bud bracts oval, strongly ridged; flowers 3 to 5-clustered from 3 to 5 mm long stout branchlets, odorless, deciduous, atrocyanous especially the calyx; buds subterete, nearly straight, upon slender glabrous 1 cm long pedicels; calyx 7 mm long, 5 mm wide across the truncate top, somewhat narrowed at the base, subterete, glabrous, with many parallel purple veins which toward the top is cross nerved; banner 3 cm long, broadly lanceolate, 1 cm wide across the middle, apex rounded, basal portion gradually clawed, sides more or less folded upon the ventral side and rugose below the middle, erect or reflexed from below the middle, glabrous, every part of it conspicuously streaked with purple; wings 1.75 cm long, 7 mm wide across the broadly rounded upwardly extending

apex, the upper side lobulate at the base of the lamina, abruptly constricted into an 8 mm long very narrow claw, also glabrous and similarly streaked; keel 3.5 cm long, the 2.5 cm long by 1.5 cm wide lamina portion broadly lanceolate, slenderly acute and ascendingly curved toward the apex, the ventrally folded sides terminated at the base by a blunt point and abruptly extended into a 1 cm long claw, quite membranous, glabrous, purple streaked; staminal tube enclosed by the keel, equalling it in length, glabrous; the free filaments one half as long, purple; anthers 1 mm long, twice as wide across the base than at the apex, basifixed; stipe 6 mm long, puberulent; ovary compressed, less in length, 5-ovuled, its thread-like neck nearly 3 cm long; stigma very small, terminal.

Type specimen number 13461, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Rooted in wet stony ground and climbing with other vines along a tree trunk partly extending over the dry Catangan creek bed at about 750 feet elevation. In Manobo "Panidehidon."

The flower bearing spikes are much shorter, flowers larger and individual parts differently shaped than in *Strongylodon mindanaensis* Elm. More distantly related to *Strongylodon pulcher* C. B. Rob.

LILIACEAE

Smilax reticulata Elm. n. sp.

A sprawling and climbing vine; stem 1 cm thick, greenish, rigid and wiry, occasionally branched, the free portion hanging, terete, the young twigs glabrous. Leaves pendant or descending, widely scattering, alternate or arising from the point of branching, the average blades 16 cm long by one half as wide below the middle, ovately oblong or ovately elliptic, the smaller ones elongated, conduplicate at the broadly rounded base and at the abruptly rounded callously thickened acute apex, entire, glabrous, shining on both sides and drying similarly brown, thinly chartaceous; veins 3, the

middle ones straight and stouter, reddish brown and smooth when dry, dull yellow, the lateral pair arising a few mm from the base and extending clear into the apex, reticulations very plain on both sides, forming a faint submarginal line; petiole 2 cm long, very thick and much ascendingly curved, drying blackish, subterete, narrowly grooved on the upper side toward the distal end, at the base surrounded by a rigid glabrous 1 cm long or longer booted bract obscurely reticulated toward the distal end, dull red in the fresh state; its stipules usually developed into a pair of tendrils. Infrutescence axillary, 5 to 8 cm long, usually only one peduncle arising from the booted persistent bract, few branched from below the middle; branchlets alternate, chiefly from about the same region, as long or longer than the peduncle proper, subtended by coriaceous glabrous bracts, somewhat compressed and striate, glabrous, curing brown; receptacle 4 to 7 mm in diameter, flatly globose, glabrous, coarsely pitted; pedicels slender, strict, 1.5 cm in length, glabrous, terete, thickened at both ends, spreading on all sides, falling with the fruit; fruit nearly sulphureous, hard and shining, flatly globose and terminally apiculate, 1 cm in diameter.

Type specimen number 13684, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Upon a jungled ridge in a humid depression between Duros and Cawilanan peaks at 3500 feet altitude.

Distinguish from *Smilax williamsii* Merr. in having larger leaves with one pair less of lateral nerves and with terete and perfectly smooth stems. It is more distantly related to *Smilax bracteata* Presl.

LOGANIACEAE

***Fagraea congestiflora* Elm. n. sp.**

Very slender tree; stem terete, straight, 1 dm thick, 8 m high; wood bitterish, odorless, moderately hard and heavy, the sapwood whitish, otherwise yellowish brown; bark gray, coarsely checked, pale yellow except the surface, relatively

thick; branches few and at the top, slender, horizontally spreading, green, sparingly rebranched, rigid. Leaves similarly disposed, opposite, scattering along the branches, chartaceous, only the very abrupt short but sharply acute tips recurved, broadly rounded and cordate at the base, curing greenish on both sides, in the fresh state a trifle paler green beneath, glabrous, entire, ovately oblong, 2 to 3 dm long, 10 to 13 cm wide toward the base; midrib raised beneath, plane above, smooth and yellowish green even in the dry state; lateral nerves of 12 pairs, divaricate, their tips ascendingly curved and faintly interarching, cross bars and reticulations obscure; petiole thick, glabrous, about 5 mm long, grooved on the upper side, curing reddish brown or black at the base; interaxillary stipule rim-like, short, rigid, glabrous. Inflorescence terminal, subpendant, rigid, in the bud state reddish brown, 5 to 8 cm long, strict, spicate; rachis thick, terete, gradually tapering to the distal end, glabrous, brown when dry, flowers rather densely clustered all around the rachis and subtended by bracteoles; pedicels 5 mm long, relatively very thick, also terete, glabrous, slightly enlarged toward the distal end, toward the base occasionally provided with minute bracts; bud calyx cup shaped, imbricate, 6 mm across, one half as high; sepals glabrous, 5, truncate at the base, broadly rounded at the apex, convex on the dorsal side, the middle basal portion quite thick and rigid, much thinner along the entire or minutely ciliate margins, nearly equal in size, 4.5 mm across, usually wider than long; corolla bud cylindrically elliptic, 1 to 1.5 cm long, 6 mm thick, broadly rounded at the apex, united except at the unequally 5-segmented apex, rigidly coriaceous, also glabrous on the exterior, valvate except the slightly imbricate distal ends; stamens 5, included; filaments inserted upon the basal portion of the corolla and falling with it, glabrous, 3 mm long, flattened toward the base, pointed toward the apex; anther oblong, 5 mm long, 1 mm wide, deeply bilobed at the basifixed base, obtusely rounded at the apex, laterally dehiscent, strongly grooved along the median lines; pistil 1 cm long, likewise glabrous, the ovary portion bottle shaped and terminated by a 2.5 mm long neck bearing an enlarged disk-like stigma.

Type specimen number 13169, A. D. E. Elmer, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected in rich soil of dense forests at 750 feet altitude and along the trail to Napsan.

Allied to but not *Fagraea racemosa* Jack.

***Fagraea epiphytica* Elm. n. sp.**

Large and coarse shrub, always epiphytic upon big trees; stems few, ascending or horizontal, 8 to 15 cm thick, 3 to 7 m long, terete, sparingly branched from below the middle; wood dingy white, finely concentric, moderately hard, the sapwood slightly bitter, odorless; branchlets long, curved or drooping, the leaf bearing tips ascending and 2.5 cm thick, doubly ridged between the opposite leaves which are from 2 cm to 8 cm apart. Blades descending, thickly coriaceous, paler green beneath, greatly varying in size, the larger ones 6 dm long and correspondingly wide, the average ones nearly 4 dm long by 1.5 dm wide above the middle, ob-ovately oblong, narrowly cuneate at the base, apex rounded or occasionally obtusely so, entire, glabrous, edges coarsely rugose, curing unequally brown on its 2 sides; true petiole averaging 3 cm long, glabrous, very thick and gradually extending into the blade or the decurrent blade extending down along its sides, at the end thickened or expanded into the rugosely lobed thick plate which is of a darker green color; midrib very stout and prominent beneath, less prominent on the upper surface of the blade; lateral nerves 8 to 11 pairs, divaricate, gracefully curved and gradually disappearing toward the distal ends, the apical and basal ones short and inconspicuous, cross bars and reticulations obsolete. Flowers sweetly odorous, from 1 to 3 in the leaf axils or in the axils of their scars; pedicel 3 to 5 cm long, glabrous, usually curved, 1 cm thick at least, with a pair of bracts above the middle, gradually thickened and extending into the calyx portion toward the apex; bracts almost 2 cm long, 1 cm wide across the base, thick, glabrous, subacute at the apex, middle basal region very thick, margins much thinner; full grown calyx 5 cm long, the basal 1 cm united and turbinate, 5-lobed, 2 cm wide across the concrete top;

lobes ascending, imbricate, ultimately spreading in a twisting and curved manner, elliptic, very rigid, 4 cm long and averaging 3 cm wide, obtusely rounded, persistent in fruit; corolla 1.5 dm long, tubular toward the base, very leathery, funnel shaped toward the 5-lobed throat, entirely glabrous, 1.5 cm thick at the base, 4 to 6 cm across the throat of the corolla, rather early falling and becoming detached at the base through decay; lobes strongly imbricate in the bud state, 4 cm long by 3 cm wide, broadly elliptic, more or less spreading after anthesis, margins wavy and the outer overlapping portion usually recurved; stamens 5; filaments 5 to 7 cm long, inserted at the middle of the corolla or a trifle below it, strongly curved, glabrous, thickened toward the base and grooved along the ventral side, fleshy; anther oblong, 1 cm wide, 2 cm long, the back flat and excavated below the middle, dorsifixed, apex rounded, base lobed, face of cells fluted prior to opening; style also glabrous and fleshy, at least as long as the corolla, slenderer toward the spirally twisting apical portion. Fruits glaucous green, set into a 6 mm wide calyx cup, ovoidly fusiform, 13 cm long by 8 cm thick below the middle, terminated by a very strong 2 cm long mucronate point.

Type specimen number 13850, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Upon the larger limbs of lofty forest trees and was only observed along the steep southern slope of Cawilanan peak at 4500 feet altitude where it was quite common. A very coarse plant for an epiphyte. The Manobo vernacular name is "Tumacos."

Flowers more tubularly elongated than in *Fagraea auriculata* Jack and petiole plates instead of being auricular are rugosely lobed.

***Fagraea jackii* Elm. n. sp.**

Suberect tree or large shrub; stem 2.5 dm thick, 7 m high, terete, crooked, branched from below the middle; wood soft, sappy white, very bitter, quite tough, odorless; bark nearly 2.5 cm thick, conspicuously roughened on the dark

gray or brown surfaces by the numerous elongated excrescences running longitudinally, otherwise yellowish; branchlets numerous, spreading and with suberect tips, curved or crooked, glabrous, with a shining yellowish brown back, angular in the dry state. Leaves opposite, mostly horizontal, nearly flat, rigidly recurved, acuminate at the apex, obtuse or cuneate toward the base, lighter green beneath, glabrous, curing dull brown on both sides, very unequal in size, elongated, varying from 6 cm to 2.5 dm long by 3 to 8 cm wide across the middle or widest portion, edges entire but conspicuously rugulose or wavy; petiole 1.5 to 4 cm long, somewhat flattened and decurrent toward the lamina end, at the base provided with an interaxillary plate less than 1 cm wide and about one half as high, all glabrous, leaving large scars after falling; midrib stout and ridged beneath, plane or slightly raised on the upper side; the lateral nerves about 15 pairs more or less, strict, subdivaricate, scarcely evident. Flowers erect, terminal, 1 to 3-clustered, generally subtended by a small pair of leaves; pedicels 1 to 2 cm long, subterete, 7.5 mm wide, likewise glabrous; calyx green, at the base subtended by a pair of 1.5 cm long oblong bracts, angular, 3 cm long, erect or ultimately spreading, united at the base, the edges tightly imbricate; segments 5, oblong, rounded or obtusely rounded at the apex, the margins and apical portion much thinner, the dorsal median portion strongly bulged or ridged and on the hollow inner side filled with latex, surface smooth especially on the lighter green or brown fresh or dry states, persistent; corolla bud greenish, solidly imbricated, glutinous toward the base; corolla 15 to 18 cm long, tubular, yellowish, fleshy, glabrous, the basal 3 cm much constricted, the middle tubular portion 1.5 cm thick though gradually widened toward the lobed portion which is 5 to 8 cm long and 1 dm wide across the spreading tip; lobes 5, white, strongly imbricate, obovately elongated, 1 cm wide at the base and at least 2.5 cm wide toward the top, broadly rounded at the apex and usually notched or 2 to 3-irregularly toothed; stamens creamy white, inserted at about the middle of the corolla tube, not exceeding the lobes; filaments 4 to 6 cm longer, compressed, glabrous, pointed

at their ends; anthers 1 cm long at least, 5 mm wide, versatile, flattened, oblong, grooved along the ventral side; style terete, greenish, fleshy, likewise glabrous, thickened toward the enlarged capitate dark green stigma, 10 to 13 cm long.

Type specimen number 13234, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

In wet stony soil of wooded banks along the Iwahig river at about 750 feet above the sea level.

Not *Fagraea nonok* *Elm.* which is in fruit only. Leaves more elongated, not acuminate and with our calyx segments nearly twice as long. It is also quite different from the Javan specimens named *Fagraea auriculata* *Jack*. Dedicated to *William Jack* who besides his missionary work did considerable work in botany of the Malaya region.

***Geniostoma laxa* *Elm.* n. sp.**

Lax shrub; stems 1 dm thick or smaller, 5 m high, branched from near the base; main branches suberect, numerous and laxly rebranched, the ultimate ones very slender, usually curved and with suberect tips; wood soft, dull sappy white, odorless, with a faint sweet taste; bark smooth, gray and brown mixed, light gray on the twigs, glabrous on the green young tips. Leaves thinly coriaceous, similarly green on both sides in the fresh state, curing nearly equally black on the sides, opposite, evenly scattered along the upper side, folded upon the same side, the slenderly acute or subcaudate apex recurved and subfalcate, entire, broadly cuneate or obtusely rounded at the base, elliptically elongated, the average of the larger lamina 9 cm long by one third as wide across the middle, occasionally much smaller especially at the top and broadly lanceolate, horizontally spreading; midrib narrowly caniculate on the upper surface, pronounced beneath, glabrous and black when dry; lateral nerves 4 to 5 pairs, relatively faint but equally seen from both sides when dry at least, ascendingly curved from the midrib, tips obscurely united, cross bars and reticulations obsolete; petiole 5 to 8 mm long, glabrate and black when old and dry, caniculate along the upper side. Inflorescence

in small clusters but occasionally solitary, without odor; pedicel 5 mm long, usually provided at the base by a pair of short acutely pointed bracts or with a single bract toward the base, puberulent or glabrate, dark green, at the base subtended by short thick and usually acutely pointed bracts; calyx broadly cupular, 3.5 mm across, glabrate when old or puberulent, shallowly rugose around the outside, only one half as high, tapering at the base into the pedicel, the basal one half united, thick and leathery; the 5 apical teeth acute and erect, parallel veined, margins thinner and finely ciliate; the basal one third of the corolla united, nearly glabrous, 3 mm long; segments elliptically oblong, with 3 parallel veins, imbricate, the free margins very minutely ciliate, the rounded or subtruncate tips inflexed in the bud state, the free portion alternating with the calyx segments and in anthesis recurved between them, falling as a whole, villous about the inner side of the throat; stamens 5, alternating with the corolla segments and inserted upon their sinuses, subsessile, erect, introrse; anther 1.25 mm long, less than 1 mm wide toward the base, apex abruptly rounded and appearing with a subhyaline point, auriculately lobulate at the base, flattened, nearly hairless on the back, quite ciliate otherwise especially along the edges, ovately elongated; filaments adnate clear to the base of the corolla; ovary circular and much compressed, 1.25 mm across, the upper or free portion strigose; style 0.5 mm long, glabrate; stigma globose, a trifle less in diameter than the ovary, appearing puberulent.

Type specimen number 12280, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Island of Sibuyan, April, 1910.

Gathered in moist gravelly soil along the wooded Patoo river banks at 1000 feet altitude.

Most similar to *Geniostoma cumingianum* Benth. founded upon *Cuming's* number 864. Leaves similar, flowers dissimilar.

***Geniostoma mindanaense* Elm. n. sp.**

Shrubby and suberect; stem 5 cm thick, 3 to 4 m high, subterete, branched from below the middle; wood very soft, greenish white, quite odorless and tasteless; bark smooth,

greenish brown, grass green except the epidermis; branches laxly rebranched, the green and glabrous young tips compressed, slender and descending or drooping. Leaves membranous, similarly disposed, flat, much lighter green beneath, when dry unequally greenish on its 2 sides, entire, apex gradually acuminate, base obtuse and occasionally inequilateral, the smallest ones broadly lanceolate, the others elongated and 15 cm long by one third as wide across the middle or below it, opposite and well scattered, the lower and terminal ones usually smaller than the middle pairs; petiole 5 mm long, green and glabrate, caniculate on the upper side; midrib dull green and rather prominent beneath, narrowly grooved above; lateral pairs 4 to 6 pairs, comparatively faint, much ascending and curved, reticulations minute and obscure; stipule in the early state pointed, when old truncately rounded, broad and interaxillary, 3 mm long, persistent, glabrous, thickly coriaceous. Flowers not observed. Fruits very dark green, in small lateral clusters, obovoidly globose, 8 mm across when fresh, glabrous, black or nearly so when dry; pedicels 3 to 5 mm long, recurved, subtended by bract vestiges; calyx persistent, pale green, glabrate and only finely ciliate along the 5 segments; seeds numerous, pitted, irregular, 1 mm across, imbedded in a juicy pulp.

Type specimen number 13812, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected in wet ground among boulders along the shaded Dalahion creek at 3000 feet altitude or just above its falls. "Sanguadan" in Manobo.

Possibly it is a *Rubiaceae*.

MAGNOLIACEAE

***Kadsura apoensis* Elm. n. sp.**

Climbing about large tree trunks and reaching the main limbs; stem 3.5 cm thick, terete, divaricately branched toward the top; wood porous, flexible, reddish, odorless and tasteless; bark comparatively thick, coarsely checked longitudinally, reddish beneath the epidermis; branchlets smooth,

somewhat drooping and recurved, yellowish brown on the twigs, greenish, forming tangled masses. Leaves alternately scattered along the branchlets, glabrous, descending, thickly coriaceous, dull and deep green on the shallowly conduplicate upper side, much lighter green beneath, the short obtuse or acute apex recurved, base broadly rounded, margins entire, in the dry state involute or slightly rolled upon the lower side, ovate or ovately oblong, drying equally brown on both sides, diverse in size, the normal blades 18 cm long and one half as wide below the middle; midrib bold beneath, furrowed on the upper side; the lateral nerves about 5 pairs, much ascending, coarsely forked toward their ends, reticulations very coarse and obscure; petiole glabrous, very thick and fleshy, 3 cm long, broadly expanded and slightly grooved above. Flowers odorless, 1 to 3-clustered from the leaf axils or from the axils of fallen leaves, upon terete 1.5 cm long bracteate pedicels; perianth segments greenish on the outer exposed sides, otherwise bright apple red, all ascending and imbricate, about 15 more or less, smooth and glabrous, erect and closely encircling the sexual organs, the middle one the largest, nearly 3 cm long and one half as wide, broadly oblong, the outer basal ones much shorter and relatively broader, the inner ones very thick, narrower and a trifle shorter than the largest bracts, all more or less united toward the base; the pistillate one soon turning reddish, upon a stout 5 mm thick stalk, 1.25 cm long, nearly 1 cm thick at the base; ovaries numerous imbricated, glabrous, oblong with truncate ends, angularly compressed, 2.5 mm long, 1.25 mm thick or wide, nearly black in the dry state; stigma brown pubescent, attached subterminally or sublaterally, obscurely compressed, 1 to 1.5 mm long, curved. Fruits apparently young, ovoidly globose, 5 cm across, hard, green except the inner side of the carpels which is deep red.

Type specimen number 11718, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Discovered this magnificent species in a very humid densely forested depression along the Mainit creek toward the Sibulan river at 4000 feet altitude. The Bagobos call it "Lomabog."

Apparently not *Kadsura scandens* Blm. nor the same as those collected by Mrs. Clemens in the lake Lanao region.

***Kadsura sulphurea* Elm. n. sp.**

Scandent; old stem 5 cm thick, bendable, crooked, terete, numerous branched 5 m above the ground, forming densely interlaced masses; wood porous, reddish tinged, quite without odor and taste; bark relatively very thick, isabellinus except the sordid brown deeply checked epidermis; that portion on the branchlets smooth and brown, tough and inclined to twine, glabrous, turning reddish brown upon drying. Leaves alternate, widely scattering, the lower or older ones larger, thickly coriaceous, usually folded, glabrous, the acute to subacuminate apex recurved, entire margins subinvolute in the dry state at least, variable in size and shape, the upper or smaller ones 1 dm long by 4 cm wide, the larger ones twice as long and thrice as wide below the middle, the larger ones broadly rounded or even shallowly cordate at the base, broadly ovate to narrowly so or ovately elongated in the smaller blades, curing dull brown on both sides, paler green or subsulphureous pulverulent; midrib raised beneath, grooved above; lateral nerves 5 to 7 pairs, ascending and only a trifle curved, tips of the lower ones forked, those of the upper ones ascendingly curved and more or less disappearing, the basal 2 to 3 pairs arising from near the base in the larger lamina, cross bars faint, reticulations obsolete; petiole 1.5 to 3 cm long, glabrous, stout, dark green when fresh, dark brown when dry, widely caniculate along the upper side, ascendingly curved from the base. Flowers subpendant, solitary or in small clusters, upon short thick green and glabrous usually curved pedicels 1 to 2 cm in length, subtended toward the base by short and broad subpersistent bracts; sepals many, diverse in size, greenish, the outer ones very short and broad, the inner or longer ones nearly 1.5 cm long, ovate to ovately elliptic, imbricate, pulverulent on the exposed outer sides or smooth and glabrous; the inner ones gradually merging into the petals; petals about 8, glabrous, oblong, 1.75 to 1.25 cm long, 0.75 to 1 cm wide, thickened at the base,

truncately rounded at the apex, ascending; male and female flowers forming an elongated cone 1.25 cm by 1 cm in dimensions; staminate flowers numerous, spirally arranged angularly compressed, the ventral side anther bearing, edges brown fringed or ciliated, 1 by 2 mm, sessile, apex obliquely truncate, the upper end usually tipped with a brown ciliate margined membrane; pistillate less numerous and only at the apical portion of the cone, very similar to the staminate flowers except the truncately rounded crustaceous stigma; ovules 2, smooth, lenticulate, encased in the basal portion of the pistil.

Type specimen number 13505, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Found among thickets and secondary woods along the fertile stream banks at about 250 feet above ocean level. "Canogon" in Manobo.

The specimens collected in the lake Lanao region by *Mrs. Clemens* have smaller leaves and flowers and no doubt are *Kadsura scandens* Blm. The field note of the Lanao specimens describes the flowers as red, ours are yellowish or exactly sulphureus.

MALPIGHIACEAE

Hiptage lawsonii Elm. n. sp.

Scandent shrub; stem crooked, terete, 2.5 cm thick, flexible, only few branched toward the top; wood soft, whitish, without odor or taste; bark grayish white, smooth, green beneath the epidermis; branches quite rigid, occasionally twining or twisting. Leaves chartaceous or rigidly coriaceous, descending, recurved, nearly flat, shining green above, much paler beneath, the entire margins subinvolute or merely recurved in the dry state, when dry brown beneath and above, glabrous, opposite, apex obtuse or subacute and recurved, obtuse toward the base though more or less decurrent at the base, subelliptic or oblongish, the larger blades 1 dm long and 4 cm wide at the middle or at its widest part, most of them however somewhat smaller, folded to-

ward the apex and edges rugosely wavy; petiole glabrous, brownish black, stout, 1 cm long, flat on the upper side at the decurrent distal end, narrowly grooved toward the base; midrib prominent beneath and slightly raised along the upper side, curing darker brown; lateral nerves 5 to 7 on each side, ascending and curved, faint, their tips anastomosing, reticulations very numerous and quite evident from beneath. Flowers in small axillary groups, ascending, odorless; pedicel green, 6 mm long, terete, slightly thickened toward the distal end, subtended by a pair or whorl of short thick acutely pointed bracts, glabrate; bud subglobose, 3 mm in diameter; calyx green, 5 mm across, also glabrate, its 5 short teeth rotately spreading, rigid; corolla yellowish, strongly imbricate, ultimately divaricately spreading, alternating with the calyx teeth and as many, the inner ones a trifle smaller, broadly elliptic or ovately elliptic, 4 mm long and nearly as broad, glabrous, minutely purple streaked in the middle coriaceous region and sprinkled along the marginal sides, entire, edges more or less wavy or recurved; ovary dark green, 3 mm across, 2 mm high, glabrous, dark reddish brown in the dry specimens, apex flattened, terminated by a short style which is surrounded by 3 short and inwardly curved stamens; filaments compressed especially toward the dilated base, 0.5 mm long; anther rotund, 0.5 to 0.75 mm long, basifixed, dehiscing longitudinally at the top, connective very dark brown and thick, cells light yellow.

Type specimen number 12551, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Island of Sibuyan, May, 1910.

Climbing upon a small tree in sand gravelly ground along the wooded banks of the Pauala river at 750 feet altitude.

Named after *M. A. Lawson* an eminent English botanist.

MALVACEAE

***Abelmoschos todayense* Elm. n. sp.**

Bi or perennials; stems few to several from the same root, green, only sparingly branched, 6 to 9 dm high, terete,

epidermis becoming longitudinally checked, covered with long yellowish and hispid hairs; root hard and tuberous. Leaves alternate and far apart, limp, early wilting, somewhat paler green beneath, curing slightly unequally brown on the 2 sides, 5-digitate, yellowish hispid on both sides, 8 to 10 cm across the lobed portion; lobes unequal, the terminal one 2 to 3 times longer than the basal ones, the basal lateral pair shortest and those of the smaller blades more united with the middle lateral pair of segments, the longer lobes 5 to 8 cm long from the base of the blade, 1 to 1.5 cm wide, linear or sub lanceolate, margins coarsely toothed, apical portion of the longer segments acuminate, that of the basal or short segments acute and roundly pointed, the basal pair usually with a large tooth or lobule along its lower side; midrib evident from both sides in all the segments, lateral nerves very obscure or obsolete; petiole 5 to 8 cm long, ciliate, likewise green but brown on the dry specimens, terete, strict, ascending; stipules deciduous, very linear, 1 cm long, only sparsely long hairy. Flowers solitary from the uppermost leaf axils, upon 2 to 3 cm long and erect short pubescent and long ciliate peduncles which are subtended by reduced leaves, odorless, nodding; calyx segments many, varying from 1 to 2 cm long, linear, 1.5 mm wide, bowl shaped at the base and tips inwardly curved, densely provided with yellowish brown setose hairs or bristles, coriaceous; petals almost 5 cm long, light yellow except the dark purple base, 5, narrowed toward the base, obovate, broadly rounded at the apex; ovary conical and angular, hairy; styles 2 from the base, adnate except toward the stigmatic portion, mostly thin and hyaline, 6 cm long; stigmas 2, protruded above the staminal tube, fleshy, flattened, expanded toward the truncate apex which is scurfy or ciliate, nearly 2 mm wide across the top; stamens enclosing the pistil except the stigma, 5 mm long; filaments dilated toward the base, usually 2-veined, separating toward the base into 5 portions, tubular above the middle and anther bearing; anthers promiscuously scattered, upon very short though slender stalks, dorsifixed, broadly elliptic, nearly 1 mm long, cells widely spreading and subpersistent. Capsule 2 cm long, 1.5 cm wide below the middle, ovoid-

ly ellipsoid, obscurely 5-ridged; seeds numerous, compressed, later in color, round or short stalked or flatly cordate at the base.

Type specimen number 11028, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

Collected in the upper region of cogonals at about 1000 feet altitude and in compact soil. The Bagobos call it "Telincaran."

Apparently distinct from *Abelmoschus haenkeanus* Presl. It was distributed under an unpublished name.

MELASTOMATACEAE

***Dissochaeta furfurascens* Elm. n. sp.**

Scandent along the tree trunks and sprawling; stem terete, 2.5 cm thick, branched all along, flexible; bark yellowish brown, shredded, green and smooth on the branches; wood green, soft, odorless and without taste, with a large brown pith; twigs long or slender, the ends drooping, angular and umber scurfy along the sunken sides, brown when dry. Leaves opposite, scattered, mostly descending, subchartaceous, lucid and slightly darker green above, the upper ones much reduced, entire, apex abruptly or gradually short acute; base of the smaller ones obtusely rounded, the larger broadly rounded and occasionally slightly cordate, ovately elliptic, the average blades 1 dm long by 4 cm wide below the middle, curing dark green, the lower side covered with isabellinus stellate hairs or scales especially along the veins and cross bars, easily separating upon drying; midvein straight and most prominent, beneath isabellinus scurfy, narrowly caniculate and glabrous upon the upper side, with 2 lateral pairs, the basal pair less conspicuous and 1 to 2 mm below the edge though parallel with it; cross bars more evident from the lower usually scurfy side, nearly straight and transverse, reticulations very obscure; petiole at most 1 cm long, very densely brown scurfy or tomentose, compressed, widened toward the distal end, ascendingly curved at the base, usually with similarly covered interaxillary bracts or buds. Inflorescence spicately

paniculate, 1.5 dm long more or less, one half as wide at the base; rachis straight, green, angular and fluted along its sides, also covered with a stellate tomentum which soon wears off; branches opposite, divaricate, the lower ones 3 cm long and subtended by foliaceous bracts, short rebranched from the middle, otherwise similar to the rachis; the ultimate branchlets 5 mm long, subtended by short caducous bracteoles or only with very densely hairy vestiges, leaving large scars upon falling; all the joints irregularly enlarged; pedicel 5 to 11 mm long, usually subtended by a small pair of puberulent caducous and minutely glandular bracts, subterete, striate, puberulent and glandular dotted, articulate at the base and early falling; calyx with a deep cavity, 1 cm long or less, 4 mm thick, shallowly constricted below the truncate apical rim, subterete, glabrous except toward the puberulent base; corolla bud slenderly tapering; petals 4, free, caducous, strongly imbricate, 1 cm long or less, oblong, base broad and truncate, apex acute and occasionally notched on the broader inner side, submembranous, glabrous; stamens apparently 7, of 2 distinct series; filaments coriaceous, ribbon-like, all inserted upon the calyx throat 2 mm below the rim, glabrous, those of the 4 substerile anthers 3 mm long and with a double loop above the middle; anthers nearly 6 mm long, very linear and tapering toward the apex, the base expanded and obscurely toothed, at the point of attachment provided with a pair of lateral blunt points; filaments of the 3 larger or fertile anthers nearly twice as long and with only a single loop; anthers of these 7 mm long, slenderly tapering to the apical pore, at the base extended into a pair of 1.25 mm long membrane-like teeth, all anthers reversed in the bud state; style 10 to 12 mm long, terete, fleshy, glabrous, 1 mm thick, slightly constricted at the small pulverulent stigma. Fruits upon twice as long pedicels, ellipsoid, including the constricted calyx rim, glabrous, yellowish green and upon the exposed sides turning atro-violaceous with age.

Type specimen number 13352, *A. D. E. Elmer*, Caba-daran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Gathered in jungled woods and associated among other

climbing vines at about 2000 feet elevation of Giwantanan knoll. "Cawelan" in Manobo.

Apparently not *Dissochaeta celebica* Blm. nor *Creochiton rosea* Merr.

***Medinilla antonii* Elm. n. sp.**

Scandent and epiphytic; stem loosely twining or looping up to 7 m above ground, crooked, subterete, flexible, 2.5 cm thick; the outer wood white, the inner one half reddish to brown, soft, entirely without odor or taste; bark very thick, lateritious except the yellowish gray and quite smooth or coarsely excrescent surface; main branches few from the top only, 1.5 to 2.5 cm thick, crookedly rebranched, forming tangled masses; twigs ascendingly curved, terete, striate, even the young tips glabrous. Leaves numerous, verticillate, rather crowded towards the ends of the twigs, coriaceous, glabrous, much paler green beneath, apex strongly recurved, obtusely rounded or gradually tapering and terminated by a mucronate point, ascending, base obtuse or subpandurate, otherwise nearly flat, curing grayish green beneath and nearly black above, exceedingly variable in size, the larger lamina 12 cm long by 3.5 cm wide at the middle, linearly oblong, edges entire, the smaller ones only one half as long and one third as wide; midrib plane above, straight, prominent and dark brown when dry beneath; the lateral veins in most of the smaller blades of 1 pair only and arising subopposite from 5 to 15 mm above the base of the leaf, the few very large blades with a second pair of lateral veins arising at the base and running parallel with the margin, the main pair extending clear into the apex; petiole 1.5 cm long, similar in color when dry, subterete and grooved along the upper side. Inflorescence profuse, lateral and below the foliage; stalks 1 to 3 cm long, arranged in verticillate clusters, umbellately few branched from above the middle, glabrous, pale green but turning brown when dry; pedicels 4 to 7 mm long, very similar to the peduncle proper, usually articulate below the middle; buds succulent, white, rather pointed; flowers odorless, pure white, rotately spreading in anthesis, 5 to 6 cm across, soon falling; calyx broad-

ly campanulate, glabrous, 1 cm long, 8 mm wide across the slightly oblique truncate rim, terete; petals deciduous, 5, subequal, obovate or obovately oblong, apex broadly rounded or slightly oblique, 3 cm long by one half as wide across the widest portion, with fine veins; stamens 10, inserted upon the ovary rim, spreading in anthesis, in 2 unequal series; filaments very linear, hyaline winged, glabrous, the shorter ones 1 cm long, the longer 1.5 cm long, curved or looped, shorter anthers nearly equalling their filaments, much curved at the thickest lower portion and slightly recurved at the apex, also much lighter in color, opening by a terminal pore, basifixed, with a 1 mm long recurved spur and a pair of 1.5 mm long lateral appendages; longer anthers as long as their filaments, much slenderer, curved, only with a minute spur and the cell appendages reduced to gland shaped bodies or excrescences, otherwise similar to the other anthers; style fleshy, almost 3 cm long, glabrous, terete, terminated by a minute stigma; ovary completely imbedded, each of the 5 cells with a wad of numerous ovules.

Type specimen numbers 13477 and 13633, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

The first number above cited was collected in a forested humid depression on the southwest side of Duros peak at 3000 feet elevation and was called "Lagicau" by the Manobos. The other more luxuriant material is from the forested ridge between Duros and Cawilanan peaks at 3500 feet altitude and was named "Etag" by the same natives. This very distinct, large and pure white flowered *Medinilla* I name after our son, *Anton Dambor Elmer*.

***Medinilla rotundifolia* Elm. n. sp.**

A tree trunk climber; stem bendable, 2.5 cm thick, up to 10 m high above ground, subterete, twistingly circling about its support, with long roots from the lower side next to its host and particularly from the joints, repeatedly branched toward the top; wood white on the outside, dark latericius in the center; bark relatively very thick, smoothish, dirty yellowish gray, latericius except the epidermis; branches

divaricate, lax, horizontal or descending, rebranched, light gray and more or less lenticelled; twigs suberect, glabrous even the young tips. Leaves opposite, similarly spreading, leathery, glabrous, much paler or yellowish green beneath, rotund, exceedingly variable in size but not in shape, entire or obscurely subinvolute when dry, curing dark or dull brown especially beneath, broadly rounded at the base and at the apex but terminated by a sharp point 5 to 8 mm in length, the larger blades 13 cm across both ways, the smaller ones less than one third as large, the average about 8 cm; midvein prominent beneath, plane above, straight clear into the apical point, with 2 lateral pairs of veins; the upper of these pairs arising 3 to 5 mm from the base, gracefully curved and confluent with the midvein at the base of the apical point; the basal pair less prominent and extending 5 mm below the margins near to the apical portion; cross bars and reticulations obsolete; petioles subterete, 2.5 to nearly 4 cm long, blackish when dry, slightly grooved along the upper side, striate beneath at the top or distal end. Flowers not found. Fruits lateral, few clustered, with a broad truncate rim, considerably constricted below it, otherwise subglobose though frequently rugose or lumpy especially toward the rim, hard, glaucous green, 2 cm long in the fresh state, the base much constricted and short pedicel-like, apparently 6-celled; peduncles ranging from 3 to 7 cm in length, smooth and glabrous, subterete, bearing few fruits toward their ends, pale green; pedicels 1 cm long, divaricate.

Type specimen number 13738, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered on a lateral side of a densely forested depression along the main ridge connecting Duros with Cawilanan peaks at 3500 feet elevation. The Manobos call it "Bodung."

Distinct from *Medinilla duodecandra* Merr. or its nearest ally.

***Melastoma setosum* Elm. n. sp.**

Spreading shrub; stem 8 cm thick, 5 m high or less, subterete, crooked, branched from below the middle; wood

sappy white, soft, without taste or odor and with a large pith; surface of the bark smooth and grayish brown, castaneous otherwise; main branches ascending, freely rebranched toward their ends; twigs ascending, green, submurinus when dry, the ultimate ones angular and striate, oppositely branched, densely covered with red bristle-like hairs or scales which are more numerous at the joints. Leaves also opposite, the terminal or smaller ones ascending, the lower or larger ones descending, flat, submembranous, deep green above, much lighter beneath, curing unequally blackish brown, appressed hirtellous on the upper and loosely hispid on the lower surfaces, the larger lamina 18 cm long by one half as wide below the middle, the smallest ones bract-like, the average probably 14 cm long by 5 to 6 cm wide, ovately elongated or ovately oblong, seldom elliptic, occasionally slightly inequilateral and somewhat curved toward the gradually tapering acute to acuminate apex, base obtusely or broadly rounded and only seldom a trifle inequilateral, entire or hispidly roughened; midvein very narrowly caniculate along the upper side, conspicuous beneath and pulverulent besides the numerous setose brown scales, with 2 to 3 lateral pairs of veins; the basal lateral pair faint and running 1 to 3 mm below the leaf edge, all the lateral pairs arising from the base and gracefully curved and extending into the apex, cross bars numerous, parallel, more or less oblique and the longer ones obliquely curved, secondary ones also numerous but much less evident on the lower side; petiole 1 to 3 cm long, channeled along the upper side, murinus when dry, densely setose, usually with a brush of finer lighter colored erect hairs in their axils. Inflorescence erect, terminal, 3 to 4 cm long and as broad, subtended by leaves; peduncle angular, setose, solitary though more commonly in 3's, when more than 1 the middle one stouter and longer, the short opposite branchlets of the middle one subtended by foliaceous bracts; flowers showy, odorless, coming into anthesis one by one; pedicels subtended by caducous bracts, 1.75 cm long, rather thick and rigid, densely beset with scale-like bristles; scales 5 to 7 mm long, the basal expanded portion 1 mm wide, edges nearly smooth except toward the scabrid bases; calyx 1 cm deep, terete, nearly

as wide across the truncate top which bears 4 detachable segments, broadly rounded at the base, campanulate, densely setose; calyx segments 1.5 cm long, expanded at the base, smooth on the inner side below the middle, coriaceous, slenderly tapering from the base to the apex, equal, 3 mm wide at the middle, the median portion toward the base thickened, ciliate hairy; setae on the concrete portion of the calyx finely scabrid along the edges, the brown surfaces smooth and shining; petals 4, rose red or light pink, early falling, 3.75 cm long, 2.5 cm wide toward the broadly rounded or across the more or less irregularly lobed or obliquely cut apex, cuneate and thickened toward the base, broadly obovate in general outline, glabrous except the apical edges which are usually brown ciliate; stamens 10, in 2 distinct series of 5; filaments of the larger series 1.33 cm long, linear, glabrous, much flattened, those of the smaller ones 1 cm long only; anthers of the smaller stamens sessile, 1 cm long, linear, the acuminate apex usually curved, the cell portion laterally lobed and rugose, at the base constricted into a pair of glands; anthers of the larger ones a trifle longer and with a conspicuously curved filamentous basal portion 1.25 cm in length, attached a trifle above the bilobed base; style terete, 2.5 mm long, glabrous, terminated by a minute stigma.

Type specimen number 14168, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in soggy alluvial soil among dense jungles of woods at the lower end of lake Danao at 5000 feet altitude. "Carayan" in Manobo.

Very closely related to *Melastoma penicillatum* Naud. and *Melastoma molle* Wall.

***Memecylon agusanense* Elm. n. sp.**

A small and handsome tree; stem 1 to 1.5 dm thick, 5 to 8 m high, irregularly terete, branched from the middle or from below it; wood hard, heavy, sapwood relatively thin, central mass brownish, odorless and with a faint sweet taste; main branches widely spreading, crooked, ulti-

mately numerous rebranched; bark thin, dirty or yellowish brown, smooth or minutely checked longitudinally; twigs lax, very slender, horizontally spreading or subpendant, terete, the young tips glabrous and turning light brown upon drying. Leaves similarly disposed, coriaceous, shallowly curved upon the upper side, yellowish pale green beneath, the young ones yellow but drying black, opposite, copious along all branchlets, glabrous, curing very unequally brown on the 2 sides, the entire margins coarsely wavy and curved upon the nether side at least in the dry state, apex usually abruptly caudate and strongly recurved, base acute to obtuse, yellow on the upper side of the distal end of the petiole, narrowly to broadly elliptic or frequently lanceolate, the larger blades 6 cm long and at least 2.5 cm wide across the middle or a trifle below it; petiole 5 to 7 mm long, flat and grooved along the upper side, glabrous, yellow when dry, arising from thickened nodes or joints; midrib conspicuous beneath, depressed on the upper side below the middle; lateral nerves 4 to 7, ascending, strict, only faintly visible from the upper side. Inflorescence axillary, the small clusters not exceeding 1 cm in length; stalk suberect, green, glabrous or in the early state pulverulent, subterete, very short branched from the middle, solitary or 2 to 3-clustered; branchlets umbellately few clustered, subtended by thick glabrous and acute bracts; flowers odorless, violaceous in color; pedicel 2 mm long, glabrous, terete, subtended by a sub-whorl of smooth acuminate pointed bracts less than 1 mm in length; buds obovoidly globose; calyx broadly cup shaped at the truncate apex, turbinate at the base, 1.5 mm long, 2 mm wide across the top when in bloom, smooth, thickly coriaceous; petals 4, comparatively membranous, caducous, free, nearly alike, the hyaline margins slightly imbricate when in the bud state, 2 mm long, 1.5 mm wide, broadly rounded at the apex, base truncately constricted, triangularly ovate, glabrous; stamens 8, inserted about the ovary, suberect; filaments subequal, 2 mm long, glabrous, subterete, tapering toward the distal end; anthers 1.25 mm long, attached to the under middle portion, 0.75 mm thick across the rounded apex; cells introrse and occupying the upper one half only, the basal one half extended into a

recurved ventrally lobed acute spur; ovary imbedded, flat at the top; style terete, glabrous, 2 mm long, terminated by a minute stigma. Fruiting pedicels 1 mm thick, twice as long, terete, glabrous, subtended by a series of unequal rather sharply pointed subpersistent and glabrous bracts; fruit 4 mm long including the broad somewhat constricted calyx portion, 3 mm thick below the middle or widest portion, smooth, glabrous, hard, apparently with a single large seed.

Type specimen numbers 13562 in flower and 14181 in fruit, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August and October respectively,

Both of these numbers were collected on steep densely forested inclines or sides of ravines at approximately 3500 feet altitude and in the general region between Duros and Cawilanan peaks. The first number cited was named "Sig-anog" by the Manobos who also named the other number "Lantoganon." They represent exactly the same species. The wood in the twigs of the flowering specimens had a slight odor of winter green or sweet chewing gum. I have on several occasions noticed this odorous character and recorded it so for *Memecylon odoratum* Elm. of Palawan.

Sufficiently distinct from *Memecylon densiflorum* Merr., *Memecylon gitingense* Elm. and *Memecylon palawanense* Elm.

***Memecylon gigantifolium* Elm. n. sp.**

A very slender tree; stem 1 dm thick, terete, crooked, 8 m high, branched at the top; wood hard and heavy, the thin outer portion whitish, lateritious toward the center, without odor or taste; bark very thin, yellowish, smooth or flaking in thin plates, more or less finely checked on the branches; twigs terete, the young portion glabrous and reddish brown after being dried, quite rigid, horizontal or the longer ones somewhat drooping, only sparingly rebranched. Leaves opposite, well scattering along the branchlets, descending, rather heavy and chartaceous, the terminal ones smaller and frequently very unequal in size, duller green on the upper nearly flat side, the young ones light green, curing very unequally brown on the 2 sides, subsessile, the smaller ones

rotund to ovate, the larger ones ovately oblong, 2.5 dm long by at least 12 cm wide below the middle; glabrous, apex gradually acute or occasionally rounded, the entire margins subinvolute, base broadly rounded and narrowly cordate; midrib exceedingly prominent beneath and reddish brown, deeply grooved along the upper surface of the leaf; lateral nerves of the average leaves about 20 pairs, subdivaricate, strict, similar in color and prominence beneath, impressed upon the upper side, the basal pair running 5 to 7 mm below the edge of the blade and strongly uniting with the tips of all the lateral nerves, few secondary ones intervening toward the base of the leaf, regular ones frequently branched, cross bars and the few coarse reticulations quite evident from beneath only. Inflorescence lateral, suberect, 3 to 5 cm long, paniculately branched from below the middle; stalks solitary or few clustered, subangular, dark brown when dry, puberulent; branches opposite or in subwhorls, subtended by rigid acutely pointed glabrous and persistent bracts which in the old state become reflexed, the lower or longer branches short umbellately rebranched, scurfy brown on the angular sides; flowers crowded from the ultimate thick branches, all stalks green when fresh; pedicels 2 cm long, terete, glabrous, subtended by a series of subpersistent glabrous and acuminate pointed 0.5 to 1 mm long bracts; calyx campanulate, coriaceous, also glabrous, 1.5 mm high, 0.5 mm wider across the truncate apex; corolla forming a cone 2 mm high and 2 mm wide across the truncate base, finally separating into about 4 segments, glabrous, submembranous; stamens 8 or twice as many as petals, included in the early state; filament smooth, less than 1 mm long, terete, fleshy, the inwardly curved apex pointed, otherwise relatively thick; anthers introrse in the bud state, 1.5 mm long at most, thickest across the rounded apex, base acutely pointed and recurved, inserted a trifle below the middle, the back side with a conspicuous gland located in the curve of the anther; ovary imbedded, its apical portion radially marked; style terete, glabrous, 2 mm long, pointed at the apex; stigma very minute. Fruits smooth and glabrous, 4 to 5 mm in diameter, bearing the calyx rim, compressed, globose, green, after when dry.

Type specimen number 13548, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

This slender tree-like undershrub was found in a wet and dense *Dipterocarpaceae* forested flat at 750 feet above sea and near a wild hog wallowing place. The Manobos call it "Magbabajag."

***Memecylon urdanetense* Elm. n. sp.**

Only a small sized tree; stem 2.5 dm thick, 12 m high, branched from below the middle, subterete, nearly straight; wood odorless and without taste, hard, heavy, tough, brownish; bark thin and very dark brown, scaling in thin plates; branches slender, divaricate, freely rebranched; twigs glabrous, terete, dull reddish brown in the dry state. Leaves horizontal or descending, flat, the acute to subacuminate tips recurved, broadly obtuse at the base, elliptic, entire, curing yellowish or greenish brown especially upon the nether side, opposite, well scattered, rigidly coriaceous, much deeper green beneath, glabrous, the average blades 12 cm long by one half as wide across the middle; midrib minutely grooved above, prominent beneath and stramineous when dry; lateral nerves obscure, the basal pair running 5 mm from the edge of the leaf and connecting with the tips of the other lateral nerves, the balance of 10 to 14 pairs divaricate and straight, cross bars or reticulations none; petiole 7 to 12 mm long, glabrous, stout, hollowed along the upper side. Inflorescence lateral or from the leaf axils, ascending, 3 to 5 cm long, subumbellately branched from the middle; peduncle when young dark brown furfuraceous, ultimately smooth and yellowish green, solitary or 2 to 3-clustered, branches angular, similarly rebranched, spreading, grooved and scurfy brown along its sides, subtended by bract vestiges, relatively short; ultimate branchlets crowded, very short and very thick, brown scurfy, subtended by short and acute bracts; pedicels glabrous, crowded, 1.5 mm long, at the base surrounded by a series of short sharply pointed bracteoles; numerous flowers fragrant, umbellately congested; calyx 3 mm deep, 3 mm wide across the

truncate apex, glabrate, cup shaped, upon a 2 to 3 mm long glabrate and terete pedicel; petals 4, triangularly ovate, straight across or truncate at the base, 2.5 mm long, rounded at the apex, 2.5 mm wide at the base, very early falling, glabrous, coriaceous though margins thinner, reflexed; stamens 8, inserted around the inner side of the calyx rim, becoming easily detached; filaments subterete, glabrous, 3 mm long; anther 2 mm long by 1 mm thick above the middle or its widest part, the basal one third devoid of pollen, backwardly curved, folded and acute, attached on the ventral side below the middle, apex broadly rounded; anther cells opening along the ventral side; ovary inferior, its sunken top radially marked; style subpersistent, 4 mm long, terete or nearly so; stigma minute. Fruits globose, 1 cm in diameter, hard and pale green, the calyx rim persistent.

Type specimen number 14113, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Gathered in dense woods upon a steep fertile and well drained incline at 3500 feet altitude situated between the peaks of Duros and Cawilanan. In the Manobo dialect it is called "Balitioan."

Its relation is very close to *Memecylon apoense* Elm. though primarily differing in its narrower leaves, more numerous and congested flowers, shorter inflorescent branches and with the submarginal vein twice as far from the edge of the leaf.

***Sonerila lilacina* Elm. n. sp.**

Solitary herbs; stem reclining at the base and taking root along its lower side, terete, reddish brown, ultimately erect, 3 mm thick, varying from 1 to 3 dm high, occasionally few branched, dark brown puberulent to pubescent, usually curved. Leaves opposite, mostly toward the top, very membranous, horizontally spreading or descending, ovate to ovately lanceolate, often the opposite pairs quite unequal in size, the nether side grayish green when dry and minutely punctulate, the upper surface sparsely covered with white ciliate hairs, margins entire about the broadly round-

ed and occasionally oblique and somewhat inequilateral base, otherwise very finely serrate, the serratures usually ciliate pointed, gradually tapering to the acute to acuminate apex, curing greenish to brown on the upper side, diverse in size, blades 3 to 5 cm long by 1 to 2 cm wide below the middle, frequently much smaller and merely bract like; petioles very slender, from 1 to 3 cm long, stramineous when dry and with brown very short more or less glandular tipped hairs, striate along the upper side; midrib practically straight, more evident from beneath, with 2 to 3 lateral pairs of nerves arising from below the middle and much ascendingly curved, cross bars very minute under a lens, that portion or region along the veins green, otherwise lilacinus beneath and purplish tinged above. Inflorescence terminal, erect, a few cm long; fruiting peduncle 2 cm long, bearing few to several capsules toward the distal end, rather stout, angular, straw brown, shining and glabrous, solitary or 2 to 3-clustered, subtended at the base by a pair or more of leaves; odorless flowers divaricate, usually pointing down hill, coming into anthesis one by one and of short duration only; pedicel of the flower not exceeding 5 mm in length, twice as long in the fruit and somewhat thickened, glabrate, strict; calyx as long as the flowering pedicel, striate and somewhat 3-angular, 2.5 mm wide across the top or widest portion, 3-segmented, green, the midvein of each of the segmented portion rather prominent and becoming ridged when old; segments ascending, 1 mm wide at the base, 1 mm long, glabrous, green, membranous, triangular, terminated in the fruiting state; buds fusiform, slenderly pointed, the petals imbricate, widely spreading in anthesis, caducous, 7 mm long, one half as wide across the base, very thin and almost transparent, 3, ovate though slenderly tapering into an acuminate point, glabrous, pulverulent on the conspicuous midvein on the dorsal side, otherwise glabrous, with quite evident lateral nerves, alternating with the calyx segments; stamens alternating with the petals and as many; filaments compressed, 5 mm long, glabrous, erect; anthers inverted in the bud state, erect in anthesis, 5 mm long, 1.75 mm wide across the auriculately lobed base, basifixed, slenderly pointed from the base to the apical pores; style glabrate,

1 cm long, strict though oblique, terminated by a smaller capitate stigma. Capsule triangular, truncately obovate, 5 mm long, as wide across the top, brown and chartaceous, persistent upon the pedicels, erect, the 3 cells dehiscing from the apex; placenta central, 3-winged especially toward the top, darker than the cell walls; seeds very numerous, 0.75 mm long, light brown, obliquely truncate at both ends, angularly flattened, apparently winged on one side.

Type specimen number 14135, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Scattering in wet red earth covered with a good layer of humus on a steep and forested incline along the trail on the south side of Cawilanan peak at 4500 feet altitude or about 500 feet below the summit. In the Manobo dialect it is called "Tagcaro."

Sonerila woodii Merr. but leaves average smaller, more ciliate especially along the edges and with a shade of steel blue or lilac. Its flowers are lilac rather than pink but otherwise the same as *Merrill's* species.

MELIACEAE

***Vavaea ardisioides* Elm. n. sp.**

Large tree; trunk 1 m thick, 20 m high, bole-like, slightly wadded toward the base, its main branches arising from the middle or above it; wood moderately hard, thin sappy portion dingy or yellowish white, the interior portion isabellinus brown, quite without odor or taste; bark 2.5 cm thick, very dark brown on the smoothish or thinly scaling surface, almost cremeus otherwise; main branches spreading, ultimately numerous and crookedly rebranched, the short twigs arising in subwhorls and ascendingly curved, only the young tips puberulent. Leaves crowded toward the ends, subcoriaceous, alternate, grabrous, curing equally brown on both sides, when fresh much lighter green beneath, ascending or horizontal, conduplicate, diverse in size, the average ones 1 dm long by 4 cm wide above the middle, obovate or obovately elongated, bluntly rounded and shallowly emar-

ginate at the apex, base cuneate, the smallest leaves scarcely one third as large; midrib stout and glabrous beneath, olivaceous puberulent along the sunken upper side; lateral nerves of 6 to 8 alternating pairs, ascending and only a trifle curved, tips much curved and anastomosing, reticulations quite numerous and more prominent on the under than on the upper side; petiole 1.25 cm long, puberulent especially upon the flattened upper side, thickened toward the base, finally glabrous. Inflorescence not observed. Infrutescence erect or nearly so, solitary in the leaf axils, about equalling the foliage; peduncle 4 to 7 cm long, glabrous, pale green and smooth, compressed, short branched toward the distal end, branchlets ascending, 1 cm long, also glabrous and compressed, subtended by short and rigid bracts, bearing at the distal end 1 to 3 fruits; pedicels 5 mm long or less, stout, subtended by bract vestiges, subarticulate at the calyx end; calyx a trifle shorter though thicker especially toward its distal end which is provided with 3 or 4 sharply pointed persistent calyx segments, subterete; fruits ovoidly globose or somewhat compressed, pale green, lividus and ultimately shining black on the same infrutescence, erect, 6 to 9 mm in diameter, apparently 2-celled and 2-seeded, the exocarp rather thin.

Type specimen number 13974, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in the woods among many spiny climbers on the summit of Duros peak at 4000 feet altitude. The natives or Manobos call it "Bagodan."

Fruits and leaves have the aspects of certain species of *Ardisia*.

***Vavaea surigaoense* Elm. n. sp.**

A nearly erect undershrub; stem 5 cm thick, 3 to 4 m high, rebranched from the middle or below it; wood moderately hard, dingy white, without odor or taste; bark brown, smooth, hypodermis green, otherwise whitish or yellowish; branches divaricate, crooked, relatively short and few rebranched, the apical portion dirty or yellowish brown short hairy; twigs rigid, ascendingly curved at the leaf bearing tips.

Leaves ascending or horizontal, rigid and chartaceous, pale green yet still paler beneath, nearly flat, the entire margins subinvolute when dry, greatly varying in size, curing brown and greenish beneath, obovate to obovately elongated, occasionally suboblong, the upper surface minutely roughened along the reticulations, on the nether side strigosely white hairy, narrowly and sharply cuneate at the base or broadly so and with rounded ends, apex rounded or short and bluntly acute, the average leaves 2 dm long by 8 cm wide above the middle; midrib very prominent beneath and cinereously pubescent, the sunken line on the upper surface filled with tawny hairs; lateral nerves 11 to 13 pairs, divaricate and nearly straight, tips strongly curved upwards and usually united, otherwise similar, the midrib cross bars and fine reticulations very evident especially so on the under side; petiole 1 cm long, flat above, dirty pubescent, stout, much thickened toward the base; bud bract densely hairy. Inflorescence erect, leaf opposed or axillary, usually subterminal; peduncle stout, 5 to 8 cm long, subterete, short yellowish pubescent, strict, the few and short branches thick, hirtellous, subtended by caducous bract vestiges, 1 cm long or more often less in length or the longer ones nearly twice as long and rebranched toward the ends, bearing 1 to 3 flowers or fruits; calyx almost 5 mm long, the basal 2 mm relatively thick and somewhat angled, densely pubescent, acute to acuminate 4-toothed, the median region of the segments obscurely keeled; corolla bud ovoidly oblong; petals 4, alternating with the calyx lobes, puberulent on the back and on the ventral side toward the distal end, oblong, 5 mm long, nearly 3 mm wide across the truncate base, obtuse at the apex; stamens about 12, unequal yet all fertile; filaments united into a 1.5 mm deep rim-like tube which is entirely glabrous on the outside and densely hairy on the inner basal region, averaging 1 mm long, the longer ones alternating with the shorter ones, much compressed, densely ciliate on the ventral side below the anther and along its back side; the anther broadly elliptic or ovately so, 1 mm long, introrse, truncately rounded at the base, connective terminated by a minute point; ovary densely ciliate pubescent, the relatively thick 2 mm long style less pubes-

cent; stigma flattish globose, 0.75 mm across, obscurely rugose, glabrous. Fruits ultimately glabrous, pale green to shining bright red, 1 cm in diameter, globose; its persistent calyx constricted toward the articulate base, the 4 teeth radially spreading, the whole of the calyx olivaceous hairy; exocarp thin, 2-celled and 2-seeded.

Type specimen numbers 13636 and 13940, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August and September respectively, 1912.

Collected both numbers in more or less compact red soil mixed with stones on the forested ridge between Duros and Cawilanan peaks at 3500 feet altitude. The former was called "Condeman" by the Manobo and the latter "Mago-tamoying" by the same native. One or two flowers were still found on the first number cited and whose leaves average larger than those of the other fruiting specimens. This same species has elsewhere been collected in the Surigao province and apparently it is common in the Surigao peninsula.

MORACEAE

***Conocephalus piperi* Elm. n. sp.**

A sprawling and climbing shrub; stem 2.5 cm thick, subterete, bendable, mainly branched toward the top; wood soft, entirely odorless and tasteless, white and brownish tinged, with a large pure white pith; old bark fumous and excrecent, lateritious otherwise; branchlets slender, avelaneus and lenticelled, tips glabrous and ascendingly curved, dusky brown when dry. Leaves horizontal or descending, coriaceous, folded upon the upper darker green surface, the entire margins wavy, glabrous, alternate, mostly toward the ends of the twigs, exceedingly variable in size, base broadly or truncately rounded, apex of the smaller ones obtuse, subacute in the larger blades which measure at least 2 dm in length and one half as wide across the middle or below it, the smaller blades ovate or occasionally elliptic, the larger ones ovately elliptic or subelongated,

curing bluish green beneath, dull brown on the upper surface and as usual in all *Conocephalus* with circular pale white blotches; midrib pronounced beneath and similarly green, plane along the upper side; lateral nerves 4 to 6 pairs, the basal pair arising from near the base, ascending, strict, their tips strongly curved upward and obscurely united, also prominent beneath and of the same color, cross bars faint; petiole ranging from 5 to 20 cm long or longer or shorter, deep brown, glabrous, subterete, smooth though more or less striate; bud or interaxillary bract about 2 cm long, also glabrous, rigid, green but the inwardly folded margins brown in the natural state, ascending, gradually tapering and curved about the twig, with a small opening at the apex and at the base in the ventral axils, always inhabited by small black ants. Inflorescence erect, axillary, fragrant, 3 to 4 cm long; stalk yellowish white for the upper one half, the peduncle or lower portion greenish, glabrous, 3 cm long, forked and with a persistent whorl of bracts at the middle, at the base provided by a series of easily falling 2 cm long elongated greenish bracts; each fork or pedicel proper bearing a 1.5 cm thick, conglomerate head of male flowers; bracts in pairs at the point of forking and at the articulated and enlarged middle portion of the pedicels, the lower pairs subpersistent, 1 cm long, broadly ovate, obtuse, glabrate, leathery, deeply spoon shaped, pale green; staminate flowers densely clustered in globose individual heads 5 mm in diameter; individual flowers normally with 3 stamens, occasionally with only 2; perianth 1.5 mm long, tapering from the base toward the subtruncate apex, at the base occasionally ciliate and provided with minute reddish glands, brown when dry, very membranous, glabrous, dividing from the apex toward the base into 3 obovately oblong segments whose apical portions is provided with few large punctate appearing glands; filament thickened at the apex or distal end, exceeding the perianth, flat, midrib brown and with hyaline sides, opposite each perianth segment; anther after anthesis extrorse. 0.5 to 0.66 mm long, subdorsifixed, ovately elliptic or oval, broadly lobulate at the base, notched or emarginate at the apex, persistent and empty cells curvingly twisted, laterally dehiscent; pistil apparently present, sterile.

Type specimen number 13653, *A. D. E. Elmer*, Cabad-

baran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Gathered from the Catangan creek banks among jungles overlying large boulders at nearly 500 feet altitude. Dedicated to *Mr. C. V. Piper* who in 1911 to 1912 spent several months in these islands investigating certain features of economic botany. The Manobos call it "Hanopol."

This is an exact match to *Piper's* number 450 collected at Mati, district of Davao, Mindanao. His and mine are the only specimens thus far collected and they can easily be recognized from the common *Conocephalus violascens* (Blco.) Merr.

MYRISTICACEAE

***Gymnacranthera laxa* Elm. n. sp.**

Middle sized tree; bole 3 dm thick, branched above the middle, 12 m high; wood soft, whitish and streaked with red vessels, odorless and tasteless; bark yellowish gray mottled, smooth, deep latericius except the epidermis, with a molasses colored juice; main branches spreading, freely rebranched; twigs lax, terete, more or less lenticelled, only the young tips yellowish brown puberulent, ascendingly curved. Leaves descending, subcoriaceous, shallowly curved upon the upper very deep green and sublicid surface, drying brown, glaucous green beneath even in the dry state, the acute or the sharply pointed subacuminate point recurved, base obtuse or on the largest ones obtusely rounded, the entire margins well curved upon the under side when dry, numerous, glabrous, alternate, 15 cm long by 4 cm wide above the middle though frequently smaller, oblanceolately oblong; midrib reddish brown beneath when dry and ridged, when fresh yellowish green, shallowly grooved along the upper side; lateral nerves 9 to 11 pairs, much less conspicuous, ascending and curved especially toward their ends which are usually united 3 mm below the edge, cross bars obscure; petiole 1 cm long, curing blackish brown, glabrous, flattened and grooved. Inflorescence lateral and usually below the foliage, profuse, very lax and flexible, spreading all

around, dull green in the bud state, varying from 3 to 10 cm long, occasionally solitary but usually few clustered, alternately branched from near the base; stalks appressed tawny puberulent or pubescent, blackish brown when dry, the ultimate portion appearing zigzag; flowers odorless, subpendant, citrinus, usually 3 to 5-clustered; the clusters well scattered, alternating and in the early state subtended by a small light brown pubescent bract; the 3 pedicels more or less united at the base and subtended by a short very thick pubescent and persistent bract, the united portion more or less expanded and irregular in shape; the pedicels puberulous, slender, 5 to 8 mm long, perceptibly thickened toward the distal end, characteristically curved, quite rigid, the terminal one usually a trifle longer; bud ellipsoid, 4 mm long, 2.5 mm thick, widest above the middle, pulverulent, obscurely 3-angular or sided especially toward the short obtuse apex; perianth segments 3, opening from the apex toward the base, the acute apical portion becoming recurved and somewhat pubescent on the upper side, otherwise puberulent, coriaceous; stamens united into an erect column, subsessile or upon a very short filamentous glabrous tube, 3.5 mm long, 1.5 mm thick, the anther cells at the apex free and only obscurely extended over the middle of the column. Fruit not found.

Type specimen number 13715, A. D. E. Elmer, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

In the humid forested depression between Duros and Cawilanan peaks at 3500 feet above ocean. "Magandau" or pretty in the Manobo dialect.

Both the leaves and inflorescence sufficiently distinguish it from *Gymnacranthera paniculata* (DC.) Warb.

***Gymnacranthera urdanetensis* Elm. n. sp.**

An upright small or middle sized tree; stem 2 to 3 dm thick, 9 to 12 m high, terete, nearly straight, chiefly branched toward the top; wood soft, whitish, streaked with blood vessels, light in specific gravity; bark thick, dark brown and scaling in plates, latericinus except the epidermis,

bleeding, freely rebranched, terete, even the young portion of the twigs glabrous. Leaves alternate, coriaceous, paler green beneath, curing deep brown on both sides, somewhat folded upon the upper deep green surface, apex short acute and recurved, glabrous, base obtusely rounded, oblong or the larger ones a trifle wider above the middle, the entire margins curved upon the under side, the larger blades 2 dm long by 7 cm wide across the widest portion; petiole very stout, 2 cm long, entirely glabrous, dark reddish brown in the dry state, the young ones pale green, fluted along the upper flattened surface; midrib yellowish green in the natural state, like the petiole when dry very pronounced beneath, appearing doubly grooved along the upper side; lateral nerves of 15 to 18 pinnate pairs, tips more strongly curved and very faintly united, otherwise rather conspicuous beneath, cross bars and reticulations obscure. Inflorescence mostly axillary, in umbellate clusters from short common stalks or tubercles, 1 to 2 cm across when in anthesis; pedicels spreading, 5 mm long, strict, stout, puberulent, at the base surrounded by a minute rim-like bract, at the distal end bearing a spoon shaped coriaceous dorsally puberulent ovate to elliptic and 3 mm long bract; bud ovoidly ellipsoid, 5 mm long, at least 3 mm thick, sessile, toward the apex more or less 3-sided, glabrate or puberulent; perianth segments 3, coriaceous, opening from the acute apex toward the united base; the apex of the stamens columnar, erect, 3 mm long, about 1 mm wide, the basal one third or filamentous portion glabrous; anther cells not quite extending to the obtusely rounded apex, varying in length, the walls light yellow and membranous. Fruits subglobose, 4.5 cm in diameter, apparently quite young, covered with a deep fulvus tomentum, upon 1 to 2 cm long ligneous stalks, the terminal or pedicel portion of which is much enlarge.

Type specimen numbers 13295 and 13294, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Both of these numbers were collected the same day in the same place along the wooded knoll of Giwantanan at 1750 feet altitude. The first number cited was called "Imos" by my

Manobo companion who as readily named the other specimens "Bantolinau." They represent the same species.

This is *Myristica cumingii* Warb. rather than *Myristica agusanensis* Elm. Chief differences from the former species are the larger fruit which is more nearly globose in shape and both kinds of flowers without the lengthened common stalk.

***Myristica agusanensis* Elm. n. sp.**

Only an ordinary sized tree; trunk terete, at least 3 dm thick, 12 m high, wadded at the base, mainly branched toward the top; wood soft and light in weight, whitish but after being cut exuding a dark blood colored sap or juice, entirely without odor or taste; bark thick, dark reddish brown and with a similarly colored sap, epidermis scaling in small plates; branches laxly rebranced, heavy, the slender twigs green and somewhat drooping, terete, glabrous, dull reddish brown when dry. Leaves coriaceous, glabrous, alternate and quite numerous, folded along the upper lucid side, glaucous green beneath, curing unequally brown on its 2 sides, the acute to acuminate apex recurved, base obtusely rounded, entire margins more or less rugulose, oblong, the larger lamina 15 cm long by 4.5 cm wide at or a trifle below the middle; midrib ridged beneath and brown when dry, plane above except toward the base; lateral nerves 13 to 15 pinnate pairs, their tips disappearing, relatively faint, cross bars or reticulations none; petiole nearly 2 cm long, glabrous, dark brown, plane along the upper side, ascendingly curved, young or bud leaves light yellowish pubescent especially on the nether side. Flowers not observed. Fruits solitary or in pairs, mostly axillary, ellipsoid, 3.5 cm long one side, hanging, fulvus brown but not pubescent, smooth; exocarp thick, longitudinally separating; nut ellipsoid, covered and impressed with deep red cartilaginous strands from the base to the apex, shining; stalks 1 to 3 cm long, greenish in the fresh state, otherwise blackish brown, flexible when young, occasionally short branched.

Type specimen number 13284, A. D. E. Elmer, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Collected this wild nutmeg tree in compact and well drained red soil along a ridge of dense woods of Giwantanan at 1250 feet altitude. The Manobos call it "Dugoan."

Related to *Myristica cumingii* Warb. and may more properly belong to the genus *Knema*.

MYRTACEAE

***Eucalyptus binacag* Elm. n. comb. *Eugenia binacag* Elm.**
Leaf. Philip. Bot. VII, 2351, 1914. *

In my opinion there are more than one species of *Eucalyptus* on the island of Mindanao.

***Eugenia abbreviata* Elm. n. sp.**

A small stocky tree; stem 2 dm thick, 7 m high, its main branches ascending and arising from above the middle; twigs numerous, erect, forming a rigid dense flattish crown, the green leaf bearing portion glabrous and subangular, the older twigs covered with a thin grayish epidermis and a cinnamon brown hypodermis. Leaves opposite, divaricate or descending, very strongly folded upon the upper deeper green and sublucid side, entire, much paler green beneath and minutely punctate, curing brown, ovate but gradually tapering to the much recurved sharply acuminate to caudate apex, base broadly obtuse, glabrous, rigidly chartaceous, margins callously edged and entire; midrib quite pronounced beneath, sunken along the upper leaf surface; lateral nerves 7 to 10 in each one half, divaricate, faint, a trifle more apparent beneath, nearly straight, their tips forming a united submarginal line, reticulations very obscure and obsolete from above; petiole 5 mm long, usually recurved, caniculate, glabrous, reddish brown or nearly black. Inflorescence usually exceeding the foliage, erect, terminal, also profuse, from 1 to 3 cm long, few and short branched at the base only, subtended by small leaves; peduncle and ascending branchlets glabrous, angular, relatively thick, the lateral articulated at the base and bearing toward the distal end a small cluster of flowers; flowers subtended by caducous bracts or bract vestiges; calyx cuneately pointed toward

the subsessile base, 5 mm high, 3.5 mm wide across the rim-like apex, glabrous, turbinate, very obscurely 5-apiculate, greenish; petals creamy white, caducous, falling separately, 1.5 mm across, margins entire or irregularly cut, inserted upon the calyx rim; stamens numerous, inwardly curved especially in the bud state, corolla colored; filaments glabrous, 0.75 mm long, dark brown, gradually tapering from the base to the fine apex; anther basifixed, the 2 subglobose pale yellow sacs well separated; ovary apex flatly cone shaped, terminated by the pointed style which bears the minute stigma.

Type specimen number 14263, *A. D. E. Elmer*, Baguio (Mt. Santo Tomas), Province of Benguet, Luzon, March, 1913.

Found in the densely wooded summit region of mount Santo Tomas at 7000 feet altitude.

Very closely related to *Eugenia parva* (Merr.) C. B. Rob. and to *Eugenia perpallida* Merr. yet in my opinion it is specifically distinct.

MYRSINACEAE

Ardisia cuprea Elm. n. sp.

Small, not an upright tree; stem 1 dm thick, 5 m high, terete; wood moderately soft, odorless and tasteless, the outer one half white, the balance reddish, tinged with distinct radial lines; bark yellowish gray, smooth, otherwise brown; branches slender, crowded toward the top, divaricate, unbranched, terete, when dry nearly testaceous. Leaves alternately scattered, horizontal or descending, smooth, glabrous, lighter green beneath, coriaceous, elliptic, entire, apex short and abruptly acute, base obtusely rounded, curving brown above and characteristically cupreous beneath, greatly varying in size, the larger blades 2 dm long by 8 cm wide across the widest portion, the upper side obscurely punctate; midrib conspicuous beneath, grooved along the upper side especially toward the base; lateral nerves also conspicuous beneath, 11 to 17 pairs, subparallel, ascending, nearly straight, toward their tips much curved upward and gradually disappearing, reticulations numerous

and quite evident from the upper side at least; petiole 1.5 to 2 cm long, very stout, somewhat thickened toward the ascendingly curved base, dark copper brown when dry, deeply channeled along the side, glabrous. Flowers not found. Young infrutescence mostly descending from the leaf axils; stalk 1 to 2 cm long, usually unbranched, the larger ones sometimes few and short branched, very thick especially toward the base, irregularly angular, at the base as well as the base of the branchlets subtended by thick transverse bract vestiges, dark brown when dry, sparsely pulverulent; pedicels few to severally clustered from the distal end, ascendingly curved, pulverulent, subterete, gradually thickened toward the distal end, at the base enlarged and leaving large scars after falling, 1 to 1.5 cm long, reddish in the natural state, similar dark brown when dry; fruits subtended by the distended 5 calyx segments, terminated by a very slender style, ovoidly globose, glabrous, 5 mm long, very dark or dull brown in the dry state.

Type specimen number 13287, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Collected in rich well drained and deeply humus covered ground near a forested ridge at 1500 feet above ocean level. The manobos call it "Sima-sima."

A critical segregate from *Ardisia disticha* DC.

***Ardisia curtiflora* Elm. n. sp.**

Tree-like shrub; stem 1 dm thick, terete but crooked, 5 m high, bearing at the top a dense crown of branches; wood soft and pulpy, white, odorless and entirely tasteless, with fine radial lines; bark yellowish brown, smooth and with lighter brown excrescences, latericius otherwise; branches divaricate, flexible, the lower or longer ones drooping and occasionally branched, otherwise unbranched, numerous, obscurely angular, much shortened toward the top where they are rusty brown, the sides striately marked from leaf to leaf, the young apical tips fulvus pulverulent. Leaves heavy and coriaceous, in distichous rows, horizontal, the slender and gradually acuminate apex recurved, conduplicate, numer-

ous, dull green except the base which is lighter colored, glabrous, curing brown on both sides, entire or the edges wrinkled, rounded at the base, broadly lanceolate to oblongish, the larger blades 13 cm long by 3 cm wide across the middle or its widest portion, frequently much smaller, obscurely punctate from both sides; midrib pronounced beneath, sunken along the upper side especially at the base and with the leaf sides curving over the caniculation, dark brown when dry; lateral nerves 7 to 9 pairs, ascendingly curved, rather fine, reticulations not evident. Inflorescence densely clustered in the lowermost leaf axils, pendant in the bud state, at most 1.5 cm long; stalks solitary and numerously branched from near the base or with a few stalks arising from the base and sparingly rebranched, all fulvus pubescent, thick, more or less angular, the branchlets subtended by bract vestiges; pedicels 3 mm in length, densely cinnamon brown puberulent, 0.75 mm thick, subtended at the base, the 5 segments ultimately spreading, triangularly oblong, 1.25 mm long, minutely puberulent on the bark especially toward the base, otherwise glabrous, dark reddish brown punctate, margins hyaline and provided with very minute cilia; petals 5, alternating with the calyx teeth, 2.5 mm long by 1.5 mm wide at the middle, elliptic, submembranous, glabrous, glandular, imbricate in the bud state; stamens as many, subsessile, nearly as long as the petals, obtuse at the apex, base auriculately lobed, basifix-ed, laterally dehiscent; connective darker brown and more or less glandular; style 2 mm long, strict, glandular and less in diameter at the apex, base conically expanded or ovary-like; stigma very small. Fruiting pedicels nearly twice as long, glabrate; fruit dark wine red when mature, flatly globose, shining, subtended by the 5 rather small brownish calyx segments, apex quite conspicuous, 8 mm in diameter or smaller.

Type specimen number 14169, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered this rare and very distinct *Ardisia* in wet alluvial soil among dense jungled woods bordering the lower end of lake Danao at 5000 feet altitude. Its vernacular

Manobo name is "Candingon."

***Discocalyx congestiflora* Elm. n. sp.**

Upright and shrubby; stem terete, 3.5 cm thick, 3 m high, more or less crooked and unbranched; wood soft, radially marked, only the thin sapwood white, otherwise reddish tinged, odorless and without taste, with a large pith; bark dull brown and smooth, isabellinus except the epidermis. Leaves alternately clustered toward the end of the thick stem or in subwhorls of seasonal growths, radially spreading, horizontal or descending, leathery, shining deep green on the upper side, paler green beneath, glabrous, curing grayish brown, elongated, the average lamina 4 dm long by 11 cm wide at the middle, entire toward the attenuate or slenderly cuneate base, otherwise minutely denticulate, apex gradually tapering to the acute and recurved point; midrib exceedingly strong and prominent beneath, curing similarly grayish, deeply grooved along the upper side; lateral nerves 13 to 17 pairs, with secondary intervening ones from the midrib to one half the distance to the margins, gradually curved upwards, their tips reticulately united, coarse reticulations quite evident from beneath, the finer reticulations more evident from the upper side; petiole 1 dm or less in length, 6 mm thick, subterete except the canal, thickened at the base and leaving large scars after falling, drying gray, also glabrous. Inflorescence usually between the whorls of the foliage, divaricate; peduncle varying from 7 to 17 cm long, stout, green, glabrous, grayish brown when dry, compressed, perceptibly thickened toward the distal end which is terminated by 1 or more of short and exceedingly thickened ligneous branches with transverse scars; bud inflorescence covered with caducous imbricated bracts; these bracts are membranous, blackish brown when dry, glabrous, whitish in the fresh state but early wilting, 1 to 1.5 cm long, oblong though gradually tapering from the base to the apex, deep purple streaked or spotted, leaving transverse scars after falling, those subtending the flower bearing stalks very similar and also caducous; panicles averaging 1 dm long, radially spreading, glabrous, purpureus

as are also the odorless flowers, very flexible and soft in texture, alternately branched from the base; the lower or larger branches rebranched from the middle; pedicel 2 to 3 mm long, glabrous, more or less gland dotted, slightly thickened toward the distal end; calyx at least 1 mm long, broader than long, the 5 segments united at the base or below the middle; segments rotund, glabrous, margins subhyaline, dark reddish brown glandular; petals equal in number, becoming nearly free, thinner in texture, also glabrous and glandularly punctate, broadly elliptic, 2 mm long by 1.25 mm wide across the middle, alternating with the calyx teeth, easily detached; stamens 5, opposite the petals and inserted upon their inner bases, falling with them; filaments compressed, tapering from the base toward the apex, glabrous, 0.5 mm long; anthers introrse, as long as the filaments, whitish in the dry state, broader than long, truncate at both ends though the upper end a trifle wider, laterally dehiscent; connective black, exerted as a stigma-like projection; ovary imbedded in the concrete calyx base; style thick, 1 mm long, glabrous, brown, bearing a blackish slightly expanded stigma. Mature fruit globose, 5 to 7 mm in diameter, glabrous, when dry almost black and obscurely punctate.

Type specimen number 13724, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected this undershrub in a very wet forested gully of rich soil at 3500 feet altitude and situated between Duros and Cawilanan peaks. "Cetaas" in Manobo.

Discocalyx longifolia Merr. but less glandular and our calyx and corolla are very unequal. The leaves are entirely too large to be classed with *Discocalyx montana* Elm.

***Discocalyx macrocarpa* Elm. n. sp.**

Tree, with a 7 dm thick and 15 dm high stem; wood moderately soft, whitish, easily cutting and splitting, odorless and tasteless; bark thick, rather finely checked longitudinally, gray or brown on the branches; the numerous

slender twigs green, heavy, usually descending, even the young portions glabrous. Leaves also descending, alternate, coriaceous, smooth and shining deep green on the upper strongly folded surface, the short acute to subacuminate point recurved, base broadly obtuse, margins entire although obscurely wavy and slightly involute in the dry state, oblongish, curing shining brown on the upper side and duller so beneath, the larger blades 15 cm long and 6 cm wide at the middle, occasionally longer and broader, frequently much smaller, glabrous; midrib prominent, flat on the upper leaf surface; lateral nerves yellowish green, 6 to 8 pairs, ascendingly curved especially toward their tips, the cross bars and fine reticulations obscure yet equally visible on both sides; petiole 1.5 cm long, glabrous, channeled along the upper side which at the base of the lamina is usually provided with a vestige of glands. Inflorescence profusely paniculate, terminal or from the leaf axils, all the stalks glabrous and green, 5 to 15 cm long, branched from below the middle; branches alternate. unbranched, when young only sparsely and minutely scurfy, subtended by blunt bracts; buds and flowers creamy yellow, alternately scattered, subtended by bracteoles, deciduous and sweetly fragrant; pedicels none or very short and thick, subtended by very sharply acuminate rigid bracts; calyx cup shaped, the basal one third thick and united, glabrous especially on the inner side, eglandular; segments 5, rotundly oblong, rounded at the apex, imbricate, the free portion 1.5 mm long by 1 mm wide, the entire margins quite thin, the middle portion thick; petals in the bud state ovoidly globose, imbricate, 3.5 mm long, below the middle united, glabrous and without glands; segments 5, yellow, elliptic, leathery, 2 mm long by 1.5 mm wide, rotately spreading in anthesis, concave upon the lower side, obtusely rounded at the apex; stamens 5, opposite the petals and inserted upon them a trifle below the middle, filaments very short and glabrous; anthers bright yellow, without glands, 1 mm long, somewhat flattened, ovate from the side view, basifixed, erect; pistils 2.5 mm long, greenish yellow, glabrous, the ellipsoid ovary gradually extending into the very short and thick style which bears the stigmatic portion across its truncate tip; fruit ovoidly ellipsoid, 2.5

cm long, shining, red and turning purple when fully ripe, with a large dull red seed.

Type specimen numbers 10553 and 10660 with flowers and 11867 with fruit, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May for the flowering specimens and September for the fruiting number, 1909.

Rather common in ravines or upon ridges of secondary forests from 2500 to 3750 feet elevation. The vernacular Bagobo name for all numbers is "Pamaluyan."

Remarkable for its tree size and large fruits. Through an oversight it was omitted in my article on the mount Apo *Myrsinaceae*.

***Embelia urdanetensis* Elm. n. sp.**

A small tree climber and sprawling over its top; stem very tough, 1.5 cm thick, densely lenticelled, terete; main branches long, flexible, rebranched, the free ends hanging; wood white, moderately soft, odorless and quite tasteless; bark brown, yellowish white lenticelled, the inner portion yellowish. Leaves glabrous, very copious, alternate, folded and strongly recurved toward the acute to obtuse apex, at the base varying from broadly cuneate to obtuse or even rounded in the largest blades, entire margins subinvolute in the dry state especially toward the base, obovately elliptic, 5 to 8 cm long without the petiole, 2 to 3 cm wide a trifle above the middle, curing gray especially upon the upper side, both sides under a lens appearing minutely black punctate; petiole 1 to 1.5 cm long, almost black when dry, stout, deeply caniculate along the upper side; midrib prominent beneath, deeply caniculate along the upper side; lateral nerves 10 to 15 pairs though with intervening secondary ones toward the midrib, oblique, tips ascendingly curved, quite evident especially from the upper side, reticulations numerous and also more evident from the upper surface. Flowers not seen. Infrutescent panicle terminal, erect, 1 to 2 dm long, relatively broad at the base; rachis stout, pale green, angular or angularly ridged, glabrous or the young tips light pulverulent; branches alternate, similar in color and shape, flexible, rebranched from near the base, yellowish pulveru-

lent, the ultimate fruit bearing branchlets greatly varying in length, almost at right angle to its stem; fruits alternately scattered from below the middle, only seldom opposite, upon very short yet distinct pedicels, globose, 2 mm in diameter, mucronate at the apex, glabrous, reddish brown spotted, ultimately becoming dark purpureous, at the base subtended by the 4-toothed calyx; pedicel subtended by persistent bracts; these bracts are 1.5 mm long, elongated, sharply pointed, in the earlier state folded on the upper or ventral side, when old reflexed, glabrate and with a few large purple spots as is also the similarly spotted calyx.

Type specimen number 13745, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Gathered from the summit woods of mount Urdaneta or Masay according to the Manobos at 6500 feet above sea level. The natives called it "Buluan."

H. N. Whitford's number 1308 from mount Mariveles is the type in flower for *Embelia whitfordii* Merr. Number 453 of *Dr. Whitford's* collection from the same mountain is in fruit. Our leaves are more distinctly nerved and upon drying turn grayish, not dark brown as the Mariveles material nor is our infrutescence pubescent.

***Rapanea glandulosa* Elm. n. sp.**

An epiphytic shrub; stems few to several, 4 to 7 dm long, branched from below the middle, 3 to 5 cm thick at the base, terete; ultimate branchlets numerous, rigid, the apical portion glabrous and ridged. Leaves terminally crowded, alternate though attached on all sides of the twigs, numerous, obovately oblong, varying 4 to 7 cm long by 1.5 to 2.5 cm wide a trifle above the middle, the entire margins somewhat curved upon the much paler green nether side glabrous, rigidly coriaceous, shining and nearly flat on the upper surface which is covered with rather large punctate glands, the lower side obscurely punctate, apex obtusely rounded or broadly rounded and minutely emarginate, toward the base cuneate, at the base decurrent, curing unequally brown on both sides; midrib prominently ridged

beneath, much less so above; lateral nerves 5 to 8 on each side, ascending, strongly curved toward their ends, very obscure though in the dry leaves more evident from the upper surface, reticulations obsolete; petiole 5 mm long, thick, dark or blackish brown when dry, flat along the upper side. Inflorescence not collected. Infrutescence copiously clustered along the branchlets below the leaves; tubercles or common stems 5 to 8 mm long, ascending, thick, terete, glabrous, covered with numerous imbricating scales transversely arranged, unbranched, alternately scattered; pedicels strict, 3 to 5 mm long, pale green, terete, also glabrous, severally and umbellately scattered from the distal ends of the tubercles, each subtended by a broad persistent bract; fruits globose or nearly so, 2.5 mm in diameter, glabrous, densely verrucose with reddish brown glands, terminated by the subpersistent slender style, at the base subtended by the 4 calyx teeth or segments.

Type specimen number 14148, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Inhabiting lofty trees on a windy north ridge at 4500 feet altitude of Cawilanan peak. "Nagas" in Manobo.

Leaves the size and shape of *Rapanea philippinensis* DC. but our fruits are densely glandular.

NEPENTHACEAE

Nepenthes surigaoensis Elm. n. sp.

A creeping and sprawling pitcher plant; stem trailing among jungles or subscandent along much slanting stems of trees up to 3 m high, seldom rebranched, 1.25 thick, the old or leafless portion brown and angular, the upper or leaf bearing portion green and also quadangular by the decurrent leaf bases, bendable, very strong and tough. Leaf bract 1 dm long, strongly imbricate and linear, tipped with an appendage; leaves alternately scattered, rather close toward the flower bearing top, the basal ones 7 to 14 cm apart, horizontally spreading, quite rigid and coriaceous, nearly flat but gradually recurved toward the acute to obtuse apex,

much paler green beneath, those without pitchers bearing a wiry tendril once or twice curved at or near the apex, only the young tips of the dendrils fulvus pubescent; blades 2.5 to 4 dm long, 4 cm wide across the widest portion, curing unequally brown on the 2 sides, the marginal sides usually curing upon the ventral side, all strongly decurrent at the base, the uppermost leaves a trifle shorter and widest at the base, the lower or older leaves longer and gradually narrowed toward the base, beneath minutely dark brown spotted or punctate, much wrinkled on the upper surface when dry; pitcher bearing tendril 1 m long or shorter, hanging, quite rigid, terete, rather straight when supported, otherwise curving, green, glabrous, tinged with red, gradually thickened from the leaf tip toward the pitcher; midrib conspicuous beneath, plane above, with 4 fine parallel veins on each side, obscure cross bars more evident from the upper side and suboblique; pitcher inclining or when lying upon mossy surface almost horizontal, ellipsoid, 1.5 dm long or shorter, dull purple spotted all over the exterior except the atropurpureus blotches on the inside, orifice very oblique though in its natural state horizontal, the lid nearly erect, the outside numerous and conspicuously veined, cross bars less conspicuous, more or less covered with glistening brown hairs, gradually curving around the 1 dm thick middle and from base to apex, few ridged on the base toward the apex or at the base of the lid; wings along the ventral or upper side extending from the upper end of the throat to within 1.75 cm from the thickened and much curved apical end of the stalk, 1 cm wide, similar in color and hairiness, membranous, its reticulations forming 2 rather obscure longitudinal lines, slenderly and finely ciliate along the entire length of the outer edge; short ellipsoid orifice stoutly provided with a thickened much recurved margin which along its upper surface is provided with a numerous transversely ridged membrane; lid 8 cm long by 6.5 cm wide, perfectly elliptic, narrowly cordate at the base where it is provided with an erect 1 cm long reddish brown pubescent point; main nerves 2 from near the base, soon becoming forked and few to several veined in each one half, the forked basal vein very prominent on the upper side and

similarly pubescent, conduplicate, shining and glabrous on the outer or lower sides, strigose on the upper side. Flowering spike terminal, 4 dm long, erect yet usually curved, flower bearing from below the middle, green stalks turning dull brown upon drying, fulvus tomentose toward the young or bud bearing tips, ultimately glabrate, when in full anthesis 6 cm thick; flowers odorless, promiscuously scattered, the lower ones subtended by a lanceolate to setaceous pointed bract, in pairs, the common pedicel in the bud state 4 mm long, the individual pedicel 8 mm long, both elongating to twice their length in full anthesis, pulverulent, at the base somewhat compressed; buds globose, 4 mm in diameter; perianth segments 4, valvate and in the bud state well overarching the anther head, persistent and subreflexed after bloom, united at the base, leathery, glabrate or pulverulent on both sides, oblong, 5 mm long by 3 mm wide, obtusely rounded at the apex, occasionally unequal in width; style or staminal tube 6 mm long, terete, glabrous, fleshy, 1 mm thick; stamens about 8, conglomerated into a flattened mass nearly 3 mm across; anthers attached along the inner side, their cells well separated, membranous, light yellow, opening along the outer free edge, both the upper and lower ends notched or emarginate. Capsules not seen.

Type specimen number 12705, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Found among the moss laden cold and windy forested ridge at 5750 feet altitude along the newly cut trail from lake Danao to the summit of mount Urdaneta or Masay as the natives call it. The Manobos named this as well as all other pitcher plants "Lapsay."

As to our Philippine species it is quite closely related to *Nepenthes merrillii* MacF. from Surigao province. In the eight specimens distributed, four were taken from a sterile plant and had considerable shorter leaves than those as here described and which may not belong to this species. In the summit region of Urdaneta or above 5000 feet there are three or more distinct terrestrial species, while on Cawilan and Duros peaks at a lower elevation there is the high epiphytic species *Nepenthes truncata* MacF.

OLACACEAE

Erythropalum grandifolium Elm. n. sp.

Tree climber; stem 2 cm thick, very flexible, mostly branched toward the top, crooked and occasionally nodulose; wood soft, greenish, with a relatively large white pith, fresh turnip odor, sweetish or tasteless; bark yellowish brown, dotted with white lenticels; twigs slender, sparingly rebranched, the free ends drooping, glabrous. Leaves glabrous, diverse in size but not in shape, submembranous or membranous, of a shining rich green above, glaucescent beneath, horizontal or descending, nearly flat, triangularly ovate, entire, gradually tapering to the acute to acuminate apex, base broadly truncate, alternately scattered, just barely peltate, the larger blades 2 dm long by 1.5 dm wide toward the base, often much smaller, occasionally with a tough tendril from the axil; midvein bold beneath, yellowish green, with 1 or 2 basal pairs, upper lateral 3 to 5 pairs, the basal ones widely divergent and at least the upper or larger pair repeatedly forked from below the middle along the lower side, the lateral pairs also branched and coarsely anastomosing, cross bars and reticulations few, plainly visible from both sides; petiole from 3 to 10 cm long, green, glabrous, slightly thickened and twisted at the base, attached 3 mm above the basal margin of the blade. Infrutescence axillary, shorter than the foliage, upon slender green subpendulous very sparingly branched stalks, bearing few fruits at their ends; fruits ellipsoid, glaucous and red, nearly 2 cm long, 1.25 cm thick across the middle; their pedicels similar in color, very slender, straight, gradually thickened toward the distal end, 3 cm long, usually subtended at the base by bracteoles.

Type specimen number 12474, *A. D. E. Elmer*, Magalanes (Mt. Giting-giting), Island of Sibuyan, May, 1910.

Collected in fertile humus covered soil of dense woods at 750 feet altitude.

It seems to differ from the bulk of other Philippine specimens by its membranous not coriaceous leaves which

average twice as large on our material and whose petioles are proportionately longer. I do not know if *Erythropalum scandens* Blm. occurs in our archipelago but our specimens are certainly not of the common smaller leafed plant.

***Platea apoensis* Elm. n. sp.**

Large tree; trunk 1 m thick, 15 or more m high; wood odorless and tasteless, white, soft throughout, very light and splendid for cutting purposes; bark mottled, smoothish; branches widely spreading, the ultimate ones rather numerous and their young tips testaceous scurfy. Leaves quite numerous, alternate, chartaceous, dark olive green on the upper glabrous and minutely honeycombed surface which in the dry state is murinus, beneath minutely scurfy and avellaneus or ashy gray when dry, the larger blades 1 cm long by one half as wide across the middle, base broadly obtuse or rounded, apex bluntly obtuse, the entire margins curved upon the under side, elliptically oblong; midvein stoutly raised beneath, deeply sunken above, also scale covered in the early state beneath; lateral nerves 5 to 7 pairs, oblique, tips gradually becoming obsolete, otherwise similar, reticulations none or very obscure; petiole deeply channeled along the upper side, 1.5 cm long, the brown scales wearing off with age. Peduncles usually solitary, 2 to 3 cm long, suberect, covered with testaceously covered scales, axillary; fruits 2.5 cm long, ovoidly ellipsoid, reddish, few, alternately scattered; fruiting calyx 5 to 8 mm long, stipitate except the short rounded lobes.

Type specimen number 11412, A. D. E. Elmer, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909; also numbers 10875 and 10582 from this same locality.

Here and there scattered in dense humid forests at 4000 to 6000 feet altitude. This also the natives or Bagobos call "Calisan."

The type number of this species is somewhat different than the other numbers cited.

***Platea fuliginea* Elm. n. sp.**

A tree of middle size, its stem 4.5 dm thick, 10 to 15 m high; bark comparatively smooth except for the lenticels; wood soft, easily cutting, whitish throughout, odorless and tasteless, light; branches spreading, freely rebranched, the twigs densely covered with a fulvus or fuliginous stellate tomentum. Leaves alternately scattered, similarly spreading, submembranous, dark dull green above, yellowish gray or green beneath, nearly flat, the sharply acute to acuminate tips slightly recurved, the glabrous upper side nearly ater when dry, the lower surface avellaneus and fuliginously finely stellately tomentose, entire, rounded at the base, ovately oblong or merely oblong, variable in size, the larger blades 1 dm long and one half as wide; midrib rather prominent beneath, densely covered with groups of fine fuliginous colored stellate hairs, glabrous along the small groove on the upper side; lateral nerves oblique, 7 to 10 pairs, similar in prominence and vestiture on the nether surface, tips strongly arching yet scarcely united, reticulations faint; petiole 1.5 cm long, fuliginously pubescent or stellate, flattish on the upper side. Infrutescence erect, 1 to 3 cm long; spike stout, light fuliginous tomentose, bearing few scattered fruits; pedicel similar in vestiture, usually bracteate; calyx less than 5 mm deep, subcampanulate, united below the middle, otherwise roundly 5-lobed; young fruits ovoidly elongated, smooth, light green except the elongated darker green apex, shining, 1.25 cm long or when mature twice as long and red in color.

Type specimen number 10613, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Quite a fine forest tree in good rather moist soil at 5000 feet altitude and due south of mount Calelan. Fairly well known to all Bagobos as "Caliso."

Only critically distinguished from *Platea latifolia* Blm. by the smaller leaves whose nerves beneath are not "gri-seo-lepidotis."

OLEACEAE

***Jasminum apoense* Elm. n. sp.**

Scandent and shrubby; branches terete, wiry, covered with yellowish brown bark coarsely checked longitudinally; twigs smooth, greenish, glabrous, dark brown when dry. Leaves opposite, widely scattering, horizontal, glabrous, sub-lucid on both sides though darker green on the upper nearly flat surface, curing equally dark coffee brown on both sides, oblong, the blades 9 to 13 cm long by 4 to 5 cm wide across the middle, the entire margins subinvolute in the dry state, obtuse to subacute at the apex, base obtuse to obtusely rounded; petiole ascendingly curved or even twisted, 1.5 to 2 cm long, widely and shallowly grooved along the upper side, glabrous, blackish brown when dry, comparatively thick; midrib deeper brown and prominent beneath, plane above or caniculate toward the base; the basal lateral pair of the nerves arising from the base and running 5 mm below the edge and connecting the upper 3 to 5 lateral pairs of nerves, all lateral ones relatively faint, no cross bars nor reticulations. Inflorescence chiefly from the upper leaf axils, seldom from the axils of the branchlets, 1.5 to 2 dm long, ascending, usually few branched, relatively short or 2 to 3 cm long, bearing toward the distal end 3 flowers, subcompressed, shining and deep brown when dry as is also the rachis, subtended by a minute bract; flowers sessile and subopposite toward the top of the very sparingly branched panicle, 1 to 2 or 3 from the distal ends of the branches according to size, also subtended by bracts of a smaller size; calyx short cup shaped, 5 mm across the 5 apiculately pointed apex, at the base abruptly constricted into a 2 cm long pedicel-like stalk, glabrous, coriaceous, minutely gland dotted especially toward the top; corolla 3 cm long, more than one half of the basal portion tubular, the 5 lobes rotately spreading, glabrous, creamy white, tube terete and 5 mm thick; lobes oblong, nearly 1.5 cm long, one half as wide, truncately rounded at the apex, at the base somewhat constricted and the sides sub-lobate, imbricate in the bud state; stamens 2, included in

the corolla tube; anther 6 mm long, subterete and much elongated, notched at the base, slenderly acute to acuminate at the apex; filament 1 mm long, nearly as wide, glabrous, inserted upon the corolla 5 mm from the base, longitudinally dehiscent along the inner edge; style also glabrous, the basal two thirds slender and terete, much expanded toward the apex, terminated by a thick blunt stigmatic point, equalling the throat; ovary glabrous, bluntly conical, 3 mm either dimension.

Type specimen number 11953, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Gathered among shrubs of dense humid forests at 4500 feet altitude along the trail to Talon to the south of mount Apo. The Bagobos named it "Solo-solo."

Allied to *Jasminum crassifolium* Blm. and *Jasminum trinervium* Merr. From the former it differs in its lateral basal nerves arising from the base of the blade; from the latter in its different calyx teeth and corolla lobes as well as in other characters.

***Jasminum rotundifolium* Elm. n. sp.**

Scandent shrubs; branches terete, green, wiry, inclined to twine, glabrous, flattened at the point of branching, sublucid, deep brown when dry; twigs opposite, even the young portion glabrous. Leaves also opposite, coriaceous, shallowly conduplicate on the upper dark green and shining surface, beneath much paler and duller, the very small apical point recurved, usually rounded or only the smaller ones obtusely rounded, the base very broadly rounded, orbicular to rotund or the smaller broadly elliptic, exceedingly variable in size, the larger ones nearly 1 dm across either way, entire, glabrous, widely scattered, curing nearly equally brown on both sides; petiole of the larger leaves 2 cm long, those of the smaller leaves only one half as long, reddish dark brown when dry, widely grooved along the upper side, relatively thick and very stout, curved and twisted; midrib raised beneath, plane above, straight from the sunken base to the apical point, with 3 to 5 pairs of secondary lateral pairs between the middle and the apex and which are

relatively faint and straight; the main basal pair of lateral nerves arising about 3 mm above the base of the lamina, gracefully curved and extending into the apex, usually with a faint basal pair, cross bars and reticulations obsolete. Inflorescence not collected. Infrutescence 2 dm long on an average, axillary or terminal, suberect, very few and paniculately branched above the middle or toward the end; stalks relatively short, subcompressed, green though dark brown when dry, glabrous as well as the peduncle, in the early state subtended by minute linear bracts; fruits usually 3-clustered from the ends of the longer or lower branches, the upper shorter branches with fewer fruits or the apical fruits arising from the rachis, subtended by similar bracts; pedicel-like stalk or constricted portion of the calyx at least 3 cm long, slightly enlarged toward the distal or fruit bearing end, otherwise brown, thick, truncate at the apex and only minutely 5-apiculate, cup shaped, 7.5 mm long or high, 1 to 2 mm narrower across the top, in the fruiting state torn open along one side though persistent; corolla bud elongated, white, the lobes strongly imbricated. Mature or nearly mature fruits shining, green and finally purple red, usually in divergent pairs, containing green cotyledones, ellipsoid, 1.5 cm long.

Type specimen number 10571, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Collected in the dense secondary forests of a ravine on the south slope of mount Calelan at 4000 feet altitude. The Bagobos call it "Allok" and it formed tangled masses among the branches of a *Glochidion* species.

It is not the preceding species. Neither is it *Jasminum crassifolium* Blm. whose leaves are described as "ovalibus" and the young branches "glanduloso-pilosiusculis."

OROBANCHACEAE

Christisonia wightii Elm. n. sp.

Terrestrial and saprophytic, succulent; stem erect, short, solitary or usually few branched and much winged toward the top, 5 cm long, occasionally forming clumps, 1 cm thick, striate, glabrous, dirty yellowish white or brown, the longer

curved, enveloped with similarly colored and glabrous imbricating scales of diverse sizes and shapes; bracts or scales toward the base short and scattered, those at the top much longer and well imbricated; branches commonly 3, arising from near the same place toward the distal end of the short thick stem, all densely surrounded at the base by numerous broadly oblong scales, very short and equally provided with imbricating scales especially toward their distal ends which bear either one or more terminal and erect flowers. Flowers odorless, protruding above the humus ground layer; bract subtending the calyx 1.75 cm long, 1.25 cm wide, coriaceous, glabrous, elliptic in outline, chiefly covering over the upper side of the calyx; calyx dark yellow or brownish, succulent, glabrous, subterete, nearly 2.5 cm long, 7.5 mm thick above the middle, a trifle narrower at the base, throat oblique and well slit open from the lower side, the upper end very broadly toothed, lateral teeth smaller, the lower end minutely lobed or not at all, early decaying or withering and forming a slimy dirty watery mass; corolla white especially on the interior except a rather conspicuous blotch in the lower corolla segment, 5 cm long, 5 mm thick toward the base, gradually inflated toward the very oblique throat, protruding above the humus covered foliage on the ground, curved above the middle and always facing down hill, fleshy, 1.5 cm across the throat, glabrous; segments about 5, subequal, 2.5 cm across when in full anthesis, rotately spreading, suborbicular; stamens apparently as many as corolla lobes, included; filaments glabrous, ribbon-like, adnate except their distal ends above the middle of the corolla; anther block shaped, 3.5 mm long, subbasifixed; pistil glabrous, nearly 5 cm long; ovary ellipsoidly elongated, upon a concrete base; style subterete, equalling the corolla tube; stigma composed of 2 broad and fleshy lobes; ovules indefinite, dark brown, divided into 2 general masses.

Type specimen number 9510, *A. D. E. Elmer*, Dumaguete (Cuernos Mts.), Province of Negros Oriental, Negros, March, 1908.

Collected in rich damp ground among the tussocks of *Amomum fusiforme* Ridl. along the upper edge of a deep ravine

at 1750 feet altitude. "Satagbak" in the Visayan dialect.

In *Zingiberaceae* a botanist must know how to unearth the flowers or fruits of certain species in the field. In this case the collector thought these flowers represented a wild species of ginger, so I was particular to locate its leaf bearing stems. Quoting from my field label,—“The clumps seem to lie loose in the fertile soil beneath the humus covering and no connection was found with other living plants.” A specimen was however sent with my other *Zingiberaceae* to Dr. Ridley for determination and who pronounced it a species of *Christisonia*. Dedicated to Robert Wight who figures a number of species of this saprophytic genus in his *Icones Plantarum* IV. It is here for the first time reported from the Philippine Islands.

PITTOSPORACEAE

Pittosporum subverticellatum Elm. n. sp.

Small tree; stem 6 m high and 5 dm thick; wood quite hard, sappy white throughout, sweetish, odorless; bark grayish mottled, densely covered with large lenticels; branches numerous, forming an elongated crown, the twigs light gray and more or less lenticelled, the green young portion glabrous. Leaves coriaceous, lucid green on the upper folded surface, much paler green beneath, the short obtuse or acutely pointed apex recurved, usually arranged in subwhorls and becoming easily detached in the dull dry brown state, broadly oblanceolate for the smaller blades and obovately oblong for the larger ones, 1 dm long excluding the petiole and 4.5 cm wide above the middle but frequently much smaller, glabrous, the entire margins subinvolute when dry, cuneate toward the base; petiole 2 to 3 cm long, rather slender, caniculate along the upper side; midvein ridged beneath; lateral nerves 5 to 7 pairs, oblique, tips becoming obsolete, reticulations minute and only evident from the nether side; bud bracts imbricate, linear and sharply pointed, hairy but soon wearing glabrous, very unequal. Inflorescence ascending or erect, axillary or interaxillary, also appearing subverticellate; peduncles solitary or few clustered, as long as the petioles, paniculate-

ly branched above the middle, at the base subtended by bud-like bracts, sparsely ciliate pubescent; pedicels 1 to 2 cm long, the lower ones occasionally rebranched, divaricate, slender, subglabrous, subtended by setaceous subpersistent bracteoles, the upper ones somewhat shorter; calyx pale green, campanulate, glabrous or pulverulent in the middle exterior region, 4 mm high, 3 mm wide, the 5 segments acutely pointed and about one third the length; corolla yellowish green or creamy white when old, 1.25 cm long, more than the lower one half tubular, glabrous; the 5 lobes oblong, roundly obtuse at the apex, strongly recurved when in bloom; stamens 5, alternating with the segments, barely exceeding the throat; filaments free, subcompressed, equalling the corolla tube, cremeus, smooth, strict; anther 2.5 mm long, linearly oblong, subbasifixed, deep yellow, sagittate at the base, minutely apiculate at the apex; ovary fusiform, olivaceous hairy or soon wearing glabrous, gradually extended into the shorter glabrous style, also cremeus; stigma slightly larger than its neck and lighter in color when dry, green when fresh. Young fruit green, bluntly oblong, 2 cm long by 1.25 cm wide across the middle, creased, 3 to 4 celled; cells with many flattened brown seeds in a slightly mucilaginous fluid.

Type specimen number 12054, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Island of Sibuyan, March, 1910.

Collected in dry soil of light woods or in secondary forests at 500 feet altitude. Its foliage with twigs are used by the natives as a remedy for stomach ailments. The local Visayan called it "Amomunpon"

This species is quite similar to *Pittosporum odoratum* Merr. yet in my opinion specifically distinct by being glabrous, with subverticellate leaves whose petioles average twice as long and by its more paniculate inflorescence.

POLYGONACEAE

***Polygonum apoense* Elm. n. sp.**

Single or in small tufts; roots ample, wiry; stems varying from 4 to 6 dm high or long, decumbent toward the base or inclined to crawl, the lower joints leafless and usually provided with roots, terete, herbaceous, green, old

stems closely jointed, young stems distantly jointed, dull brown when dry, usually branched from near the base, the younger portion of the stem yellowish strigose; joints clothed with boot-like sheaths 1 to 1.5 cm long or those along the old stem withered down to a broad shallow cup, brown, truncate at the apex or nearly so, yellowish brown strigose especially toward the bristly top, submembranous. Leaves alternate, well scattered, obovate or obovately elongated, submembranous, spreading divaricately, flat, rich or deep green above, much lighter beneath, curing nearly equally dull brown on both sides, entire, glabrate above, minutely puberulent beneath or subglabrate, the average lamina 8 cm long by 3.5 cm wide above the middle, apex bluntly pointed and obtuse, base cuneate; petiole 1.25 to 2 cm long, deeply caniculate along the upper side, short strigose beneath, ciliate along the upper lateral margins; midrib puberulent on both sides, darker brown beneath, slightly raised also on the upper side especially toward the base; lateral nerves 7 to 11 pairs although with secondary intervening ones along the midrib, faint, ascendingly curved especially toward their distal ends, cross bars and reticulations quite numerous and very faint. Inflorescent spikes subterminal, erect, ascending, solitary or 2 to 3-branched from the base where it is usually subtended by small leaves, greatly varying from 1 to 3 dm long or even longer, very slender and usually strict, curing straw brown, sides fluted, puberulent, flower bearing from below the middle; flowers usually only one in anthesis at a time, odorless, light pink or roseus, erect, evenly scattered except toward the base; nodal sheath 3 mm long, brown, submembranous, truncate and obscurely pointed at the top, the outer portion more prominently pointed, glabrous on the inner side, dull yellowish brown ciliate on the outer side and along the upper edge; flowers 1 to 3 from each joint, each nodal group alternating with the adjoining ones; involucre surrounding the flowers brownish, more membranous than the sheath, 1.5 to 2 mm long, glabrous, more or less united below the middle or nearly free, the 3 to 5 lobes diverse in size and shape, usually oblongish, apex acute to subtruncate, each segment with a midrib; pedicel relatively stout, 2 mm long, also glabrous, compressed and

obscurely winged, equalling the sheath, persistent, slightly thickened at the top; corolla or perianth exerted, recurved in the later state, 3.5 mm long, constricted at the base into a short pedicel-like stalk; lobes 4 or 5, united toward the base, imbricate, glabrous, unequal, obscurely veined, ovately elongated or oblongish, apex acute or narrowly obtuse, larger in the older flowers; ovary obovoid, 0.75 mm long; styles 2, fleshy, they as well as the ovary glabrous, gradually tapering toward the minute capitate stigmas; stamens about 5 or only 4, inserted below the middle of the corolla, the fertile ones alternating with glands at the point of insertion, chiefly alternating with the segments; filaments erect, glabrous, 1.5 mm long, gradually thickened from the apex toward the base; anther subbasifixed, notched at both ends especially at the base, ovately oval, 0.25 mm across. Old flowers or young fruits much recurved, the perianth segments enlarged and deeper red; ovary large, compressed and elliptic from the side view; styles elongated and recurved toward the stigmatic ends.

Type specimen number 10754 *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Discovered in rich soil of open glens of dense forests at 3750 feet elevation. The Bagobos call it "Carecut." A handsome species with deep purple red flowers.

PROTEACEAE

***Helicia integrifolia* Elm. n. sp.**

A small sized and suberect tree; stem crooked, irregular, 2.5 dm thick, 7 m high or higher, branched from the middle; wood soft, radially marked, only the very thin sapwood white, otherwise nearly fulvus brown mottled, latericinus beneath the epidermis; branches relatively short, ascending and crookedly rebranched, ridged, the ultimate ones glabrous and obscurely compressed at the point of the leaf attachment. Leaves ascending from the base, recurved toward the distal end, chartaceous, folded upon the darker green upper side, the young ones pale green and purplish tinged, curing unequally brown on the 2 surfaces, glabrous, the

entire edges slightly involute in the dry state at least, rounded toward the apex and terminated by a short broad point, obovate or obovately elongated, opposite, the average ones 2 dm long by 8 cm wide above the middle, cuneate at the base, the margins perceptibly decurrent clear to the swollen basal portion of the petiole; midrib stout, ridged along both sides, dull reddish brown; lateral nerves lighter brown especially on the upper side, relatively prominent, much ascending and curved toward their distal end, about 7 pairs although the basal 2 pairs are faint, tips anastomosing; cross bars few, reticulations more numerous, both quite evident from both sides; petiole 1 cm long, the sides with a narrow lamina portion, the basal one half much enlarged and dark when dry, glabrous. Spikes terminal, axillary or lateral, much recurved, varying from 1.5 to 4 dm long, usually solitary; rachis glabrous, when fresh dark bluish on the exposed sides, curing black, terete, the young apical portion puberulent; flowers irregularly scattered from near the base, odorless; pedicels in pairs, 4 to 5 mm long, 1 mm thick, sparsely strigose, subdiscoid at the distal end, each with a small bract on the outer side below the middle, falsely united at the base; perianth 2 cm long, cylindric in the bud state, apex much enlarged and ellipsoid, base only obscurely swollen, becoming easily detached; segments valvate, first becoming separated below the middle, 4, ultimately separating the full length toward the apex and the lobes settling about the base in a curved and twisted manner, the apical portion oblong and obtusely pointed, glabrous, coriaceous; stamens as many as perianth lobes, inserted upon the perianth in the bulged apical portion, opposite the segments; filaments adnate, compressed, glabrous, inserted 3.5 mm below the apex of the perianth lobes; anther 2.5 mm long, narrowly oblong, the thick connective convex along the dorsal side and terminated in a blunt somewhat inwardly curved point, the comparatively thin cells opening along the inner side, 1 mm wide above the middle of the widest portion; ovary fusiform, 2 mm long, glabrate, surrounded at the base by 4 more or less quadrangular thick and glabrous plate-like segments; style also glabrous, slender, as long as the perianth or a trifle

longer; the stigmatic portion distinctly clavate.

Type specimen number 13392, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Inhabiting moist well drained soil of a forested ridge at 2500 feet altitude on Giwantanan knoll. According to the Manobos its vernacular name is "Salimay."

Near to *Helicia integra* Merr. though with larger leaves which are not oblong to lanceolate and whose nerves and cross reticulations are more prominent.

RANUNCULACEAE

***Naravelia antonii* Elm. n. sp.**

A medium sized tree climber; old stem 2.5 cm thick, subterete; wood tissues in radial yellow and white sections, pith large and white; bark very dull or dark brown and more or less checked longitudinally, thick, of the wood color except the surface; branches green, slender, the free ends drooping, the tips glabrous and glaucous green, terete and striate, very tough. Leaves leathery, ovately elongated, opposite, deeply folded upon the upper slightly greener side, later on both sides when dry, radially spreading, entire, truncately rounded or shallowly cordate at the base, gradually tapering to the bluntly rounded point which frequently becomes emarginate, 3-foliate, the average lamina 12 cm long by 6.5 cm wide below the middle, glabrous even when young; midrib straight or nearly so, quite evident beneath, also nearly black when dry, with 2 or 3 pairs of lateral veins, all arising from near the base, the basal pair faint and relatively short, the next and inner pair much ascendingly curved and along the outer side connected with faint cross bars, reticulations none; petiolule 2 to 3 cm long, ascendingly curved from the base, often twisted or tendril-like, subterete, brown to black and curved, succulent and green in nature; petiole divaricate, 1 dm long or shorter, terete, wiry, flattened and expanded toward the base. Flowers not seen. Panicle from the leaf axils; peduncles occasionally tendril-like, very strong and wiry, straw brown, the branched portion as long or longer; branches

opposite, widely spreading but only sparingly rebranched, subtended by persistent bracts; pedicels verticillate toward the ends of the larger branches and few to severally clustered toward the distal ends of the ultimate branches, 3 to 6 cm in length, slender, straw brown on the dry specimens, also subtended by minute persistent bracteoles, subterete and finely striate, almost straight, nearly glabrous, thickened toward the distal end; receptacle conical, ciliate pubescent; achene compressed, reddish brown, cinereously hairy, 5 mm long, elongated and pointed at both ends with a 5 to 8 cm long silky coma which forms a globose mass of gracefully interlaced soft hairy tails.

Type specimen number 12734, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Climbing along small trees and then sprawling over their tops along a wooded ridge at 3500 feet altitude of Duros peak. Named after *Anton D. Elmer* our son. Called "Obanon" by the Manobos.

Its relation seems to be with *Naravelia uncinata* Cham.

RHAMNACEAE

Gouania microcarpa subglabra Elm. n. var.

A scandent shrub; stem flexible; wood greenish; twigs green, terete, slender, somewhat drooping, the young portion olivaceous puberulent. Leaves chiefly descending, conduplicate on the upper dark green and lucid side especially so toward the recurved acute to acuminate apex, much paler green or subglaucous beneath, broadly or truncately rounded at the subentire base, otherwise minutely serrate or apiculately dentate, glabrous except the nerves beneath, much varying in size, ovately elongated, the average blades 8 cm long by 4 cm wide toward the base, alternately scattered along the twigs, curing unequally brown on the sides; midvein olivaceous strigose on the nether leaf surface, glabrous and minutely caniculate on the upper side; lateral nerves about 5 pairs, much ascending, tips extended along the edges,

also conspicuous beneath and similarly hairy, the basal pairs 3-branched along the lower side, the apical pair subparallel to the midvein, cross bars or reticulations fine and very obscure; petiole 1 cm long, at first olivaceous pubescent, soon becoming glabrate. Inflorescence greenish throughout, when dry short olivaceous pubescent or puberulent; spikes solitary or few clustered, terminal or from the uppermost leaf axils, very slender, 2 to 3 or more dm long, usually leaf bearing toward the base; fruits scattered, solitary or 2 to 3-clustered; pedicels slender, 3 mm long, soft pubescent, subtended at the base by 1 or more bracteoles; carpels 3-winged, 5 mm high or long, 5 to 8 mm wide, dry and glabrous.

Type specimen number 11308, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Collected among jungled tree tops in the humid woods at 3750 feet elevation and along the Baruring river trail to Talon. "Solo-Solo" is the Bagobo name.

Possibly this plant should be considered a new species rather than a variety of *Gouania microcarpa* DC.

ROSACEAE

Photinia urdanetensis Elm. n. sp.

An upright and tree-like shrub; stem terete but crooked, 1 dm thick at least, 5 m high, branched from the middle; main branches crooked, rigid, ascending, rebranched toward the top; wood very hard, heavy, odorless and tasteless, incarnatus on the outside, the heartwood atropurpureus; twigs quite numerous, lax, relatively short, terete, the young apical portions tawny pubescent, drying similar in color, relatively short. Leaves very numerous, opposite, rigid, mostly horizontal, the acute to acuminate apex recurved, flat otherwise, lucid dark green especially above, paler green beneath, deep brown when dry, obtuse at the base, entire margins subinvolute in the dry state, from 3 to 5 cm long, 1.5 to 2.5 cm wide across the middle or just below it, elliptic or ovately so, the smaller ones broadly lanceolate and terminal, dark fulvus hairy when young, becoming

entirely glabrous; midrib prominent beneath, plane above; lateral nerves oblique, very obscure from the nether minutely punctate side, 13 to 17 main pairs, cross bars or reticulations obsolete; petiole subcompressed, 3 mm long, relatively very thick. Panicle erect, 3 to 5 cm long, terminal or also from the uppermost leaf axils, very short branched toward the top; peduncles strict, striate, 2 to 3 cm long, fulvus pubescent; flowers odorless, few clustered from the ultimate branches, ascending in the bud state, when in anthesis usually recurved; pedicles 5 mm long, finely pubescent, at about the middle bearing a whorl of 3 bracts; bracts varying from 1.5 to 2.5 mm long, oblong, obtuse at the apex, rigidly chartaceous, similarly pubescent; calyx 4.5 mm high and nearly as broad, broadly cup shaped, puberulent or finely pubescent on the back especially the 5 segments; segments very broadly ovate, rigidly coriaceous, less than 2 mm long, 1 mm wider; petals as many as calyx lobes and alternating with them, coriaceous, 2.5 mm long and as wide, broadly ovate, puberulent on the dorsal side of the middle portion, with few punctate glands above the middle only, cuneate toward the truncate base, widest across the middle; stamens about 10, erect; filaments from 1.5 to 3 mm long, glabrous, subterete, pointed at the apex, widest below the middle and inserted upon the rim-like base; anthers subdorsifixed, oblong, 0.5 mm long, with a pointed apex, base broadly rounded and minutely notched; ovary surrounded by a glabrous rim, compressed globose, less than 2 mm across, minutely pubescent, brown when dry, bearing a mucronate nearly black and glabrous stigma.

Type specimen number 13694, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered among the low rigid woods along a wind swept cold and mossy ridge at 5500 feet of mount Urdaneta or Masay as the natives call it. Named "Sambolanan" by the Manobos.

RUBIACEAE

Amaracarpus apoensis Elm. n. sp.

Lax shrub less than 2 m high; stems and branches greenish, quite rigid, the latter numerous and widely spreading horizontally; twigs numerous and slender, latericulus pubescent especially the young tips. Leaves also horizontally spreading, lucid and bright green above, much paler beneath, flat, membranous, glabrous except the nerves on the nether side, drying equally dull or dark reddish brown on the sides, opposite, regularly scattered along the twigs, frequently with one or a pair of smaller leaves in the axils, 2 cm long, 7.5 mm wide across the middle or above it, elliptically oblong or ovately so, entire, the axillary ones much smaller and even bract-like, obtuse at the apex, base acute or broadly cuneate; midvein conspicuous beneath, reddish brown hairy especially when young; the larger blades with 4 pairs of lateral nerves, quite evident from beneath, divaricate and ascendingly curved, tips conspicuously interarching and united, reticulations none, similarly hairy; petioles very slender, reddish pubescent, varying up to 5 mm in length; stipule subglabrous, 3 mm long, truncate except the seta-like bristles on each side, rather rigid. Flowers axillary, ascending, 1 to 3-clustered, greenish white except the green calyx tips; peduncle very short and subtended by a pair of foliaceous bracts; pedicel thick, 1 mm long, densely brown hairy; calyx 4 mm long, the 4 segments united at the base or toward it, narrowly oblong, glabrous or only strigose in the sinus between the lobes; corolla elongated or tubular, white, glabrous except the throat, 4 mm long, the basal one third united and more or less constricted; oblongish segments also 4, thick, valvate, obtuse, tips incurved, at least 1 mm wide; stamens of an equal number, alternating with the segments and inserted upon the throat or to some extent in the tube; filaments glabrous, slender, 1.5 mm long; anther compressed, oblong, introrse, nearly 1 mm long and one half as wide; ovary superior, truncately globose, glabrous, 0.75 mm in diameter; style 1 mm long, slender, strict, also glabrous, forked at the distal end; fruit 5 to 6

mm long, 4 mm thick a trifle above the middle, obovoid usually, roundly truncate at the apex and calyx still intact, sharply pointed at the base, at first hairy, ultimately glabrate, prominently rugosely ridged when dry.

Type specimen number 10737, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

This rare undershrub was discovered in very rich moist soil of dense forests at 3500 feet altitude along the southern side of the Baruring river. The Manobo name is "Poagan."

Distributed as *Amaracarpus microphylla* Miq. and so reported it on page 1036 of this publication. Dr. Valetton kindly informs me that it differs from Miquel's species in having distinct petioles and whose flowers are not at all bell shaped. It is most closely related however to *Amaracarpus brauniana* (Warb.) Val. of New Guinea.

RUTACEAE

Clausena todayensis Elm. n. sp.

Tree, with a 10 m high and 3 dm thick stem; bark mottled, smooth and brown on the branchlets, rank bitter; wood yellowish white, moderately hard and heavy, odorless but with a bitterish taste; twigs roughened with lenticels, puberulent when young. Leaves imparipinnate, thinly coriaceous, paler green beneath, dark green on the upper conduplicate surface, the acute to acuminate tips strongly recurved, alternating along the branchlets, curing light beneath and dark blackish brown above horizontally spreading, 5 to 7-foliate; peduncle terete, 1.5 cm long, puberulent, the internodes about as long and similarly hairy; leaflets punctate beneath, slightly unsymmetric, oblongish, entire toward the base, obscurely crenate or undulate, the base obtusely rounded, the terminal leaflet the larger, the basal pair subopposite and much reduced, the larger ones 7.5 cm long by 3 cm wide at the middle, sparsely pulverulent or puberulent on both sides; lateral pairs 5 to 9, divaricate, also black on the nether side, straight, their ends more or less archingly united few mm below the edge, reticulations coarse

especially toward the ends of the nerves; petioles only a few mm long, the terminal leaflet upon a 1 to 1.5 cm long rachis extension. Inflorescence ascending, terminal, paniculate, 1 to 2 cm long; all the stalks terete, green, brown puberulent, the lower or longer branches repeatedly rebranched from below the middle, the ultimate branchlets subtended by minute bracts; flowers solitary or usually in small terminal clusters, subtended by a bract-like rim which is finely ciliate along the margins; pedicel 1 mm long, relatively thick; sepals 4, cremeus, caducous, elliptically oblong, 3.5 mm long by one half as wide across the middle, margins hyaline, densely sprinkled with purple or reddish brown, the middle portion with a few large pellucid glands, unequal in width but not in length, glabrous, deeply concave on the ventral side, just inside of this whorl of organs is a saucer shaped whorl of persistent organs 1.25 mm high and with 3 to 5 finely ciliate blunt teeth; stamens 8, erect; filaments 2 mm long, fleshy, compressed, purplish brown sprinkled, pointed at the apex only, ovate or ovately oblong in shape; anther 1.5 mm long, truncately oblong, emarginate at the apex, the basal one half divided, attached in the sinus; ovary more or less rugose, 2 mm long, short stipitate, obscurely 4-angled and with some large glands, terminated by a circular stigma.

Type specimen number 10530, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

On a densely wooded ridge south of the Sibulan river at 1500 feet altitude. "Dangolais" is the native or Bagobo name.

***Evodia arborea* Elm. n. sp.**

A middle sized tree; stem 6 dm thick, terete, more or less crooked, 14 mm high, branched mainly at the top; wood soft in texture, light in weight, both odorless and tasteless, white except the dingy or yellowish or even yellowish gray epidermis; main branches widely spreading, freely rebranched and forming an umbrella shaped crown; twigs ascendingly curved, glabrous at the young tips, grayish green, compressed at the leaf insertions. Petioles also

green, horizontally spreading, subterete, 5 to 8 cm long or the smaller leaf petiole shorter, glabrous, blackish brown when dry, leaving large scars after falling; leaflets trifoliate, thinly coriaceous, horizontally spreading, very unequal in size, glabrous, conduplicate on the upper sublucid side, beneath a shade lighter green, curing darker brown on the upper surface, the entire margins subinvolute when dry, apex abruptly terminated into a short recurved point, base broadly obtusely rounded, elliptic, greatly varying in size, the larger lamina 12 cm long by one half as wide across the middle, the smaller leaflets one half as large; midrib plane above, prominent beneath, darker brown than the leaf sides in the dry state; lateral nerves 10 to 15 pairs, divaricate, ascendingly curved toward the disappearing tips, reticulations very minute; petiolule 5 mm long, similar in color and glabrous, ascendingly curved, only very shallowly grooved along the upper side. Inflorescence erect from the uppermost leaf axils, paniculate, 5 cm long or much shorter, commonly branched from above the middle or from near the base, usually solitary but when branched opposite, relatively short and cinereous; branches subtended by small bracts, appearing thickened toward their distal ends, the ultimate ones more densely cinereous or subolivaceous tomentulose; flowers pure white, with a sweet anise odor; pedicels clustered toward the ends of the ultimate relatively thick branchlets, 2 mm long, usually somewhat curved, olivaceous puberulent, subtended at the base by short thick and similar pubescent bracts; calyx 4-segmented, rotately spreading, persistent, united at the base; segments ovately triangular, 1 mm long, on the back toward the base finely puberulent, on both sides with large lighter colored punctate glands, obtusely rounded at the apex; corolla bud rugosely ellipsoid, valvate; petals as many as calyx segments and alternating with them, more numerous gland punctate above the middle, glabrous, inwardly curved and more or less twisted, submembranous, nearly as wide across the base; stamens 4, alternating with the petals, similarly curved; filaments 2.5 mm long, glabrous, flattened and widest toward the base; anther elliptic from the side view, 1 mm long, dorsifixed or versatile, notched at both ends, the cells longitudinally dehiscent and well separated;

ovary compressed, densely hairy, 4-rugulose, at the middle bearing a short glabrate and erect style.

Type specimen number 13159, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

This fine tree species was collected in damp forests of fertile soil along the trail to Napsan at about 750 feet above sea level.

Its relation is with *Evodia semicarpifolia* Merr. and *Evodia glabrum* Blm. though especially related to the latter.

***Evodia benguetensis* Elm. n. sp.**

Suberect, small tree or shrub like; branchlets erect, rather numerous, yellowish gray, the green terminal or leaf bearing portion glabrous, roughened more or less by the leaf scars. Leaves 3-foliate, similarly disposed, oppositely crowded, 6 to 9 cm long, glabrous even in the young state; petiole 2 to 3 cm long, ascending, drying brown, rather slender, subterete, larger leaflets 6 cm long and 2 cm wide above the middle, obovately oblong, apex rounded and occasionally emarginate, base cuneate, the lateral ones frequently inequilateral, callous margins entire and rather conspicuously recurved upon the nether side, drying unequally green or brown on the 2 sides, rigidly chartaceous, subsessile or upon a very short petiolule, articulated at the base, deeper green and sublucid on the upper side; midrib ridged beneath, caniculate above, smooth and more yellowish green or brown; lateral nerves about 10 on each side, very obscure, divaricate, their ends forming a submarginal line, reticulations quite evident from the lower side only. Inflorescence 2 to 3 or even 5 cm long, branched above the middle, arising from the uppermost leaf axils, erect or ascending; peduncle 1.5 to 3 cm long, strict, glabrous, striate or subcompressed; branchlets opposite, the lower or longer ones subtended by obovately elongated perfectly glabrous green bracts; flowers more or less clustered toward the distal ends of the ultimate branchlets; bud pedicels very short, relatively thick, subtended by blunt bracteoles; flowers usually in groups of 3, subtended by vestiges of bracts; pedicels 2 mm long, glabrous; buds subglobose; calyx green, 1 mm long, 4-toothed, the greenish glabrous teeth obtuse; petals

yellowish, also glabrous and of an equal number, ovate to elliptic, obtuse, 1.5 mm long by 1.25 mm wide below the middle; stamens 5, glabrous; filaments subterete, attached to the nether side of the ovary, at least 1.5 mm long; anther dorsifixed, oval, 0.75 mm long, deeply emarginate at the base; ovary disk-like, 1.25 mm across, with 4 sessile stigmas.

Type specimen number 14274, *A. D. E. Elmer*, Baguio (Mt. Santo Tomas), Province of Benguet, Luzon, March, 1912.

Collected along an open more or less rocky ridge trail at 6750 feet altitude. Along this same trail was seen a coarse *Anenome* in flower and the only thistle species of the Philippines.

Differs from *Evodia dubia* Merr. in being entirely glabrous, its leaflets broadest above the middle not at the middle and which are more obtusely rounded at the apex. Again, its leaflets are less than one half as large and foliage more numerous than in typical *Evodia retusa* Merr. Bureau of Forestry number 4965 from the same mountain is exactly our species in fruit.

Melicope mindanaensis Elm. n. sp.

A suberect tree-like shrub; stem 1.5 dm thick, 7 m high, mostly branched toward the top, crooked, subterete; wood white or yellowish tinged, light in weight, soft, tasteless, sweetly odorous especially in the branchlets; bark yellowish gray, smooth on the surface, otherwise yellow except the green hypodermis; main branches spreading, crookedly rebranched, the lax subdrooping twigs with ascending glabrous tips. Leaves unifoliate, opposite, profuse along the branchlets, coriaceous, ascending, glabrous, paler green beneath, curing equally brown on its sides, only shallowly conduplicate, smooth and shining as well as punctulate on both surfaces, the average blades 1 dm long by 4.5 cm wide across the middle or above it, frequently much smaller, obovate or obovately elongated, entire, the margins subinvolute in the dry state, obtusely or broadly rounded at the apex, the young ones mucronate, the old ones usually emarginate, base broadly cuneate; midrib ridged beneath; lat-

eral nerves 7 to 11 pairs, divaricate, their tips interarching and anastomosing, reticulations scarce toward the middle or midrib; petiole with petiolule ranging from 1 to 3 cm long, the basal two thirds terete, the apical or petiolule portion grooved along the upper side, the connective portion somewhat thickened and darker green, the petiole portion enlarged at the base and leaving large scars after falling. Panicle 5 cm long or shorter, solitary and mainly from the upper leaf axils, glabrate; branchlets from below the middle, opposite, divaricate, usually subtended by caducous and glabrous bracts; pedicel 1.5 mm long, easily separating, subtended by 3 apical bracts, all glabrous; buds ovoidly ellipsoid, 2 mm long; calyx punctate, 1 mm long, erect, united at the base, terminated by 4 acute teeth-like segments, also glabrous; corolla twice as long, equally as many, alternating with the calyx segments, oblongish, valvate but separating from the base toward the apex, obscurely punctate; stamens 6, sterile or nearly so; filament 1 mm long, linear, flattened, subhyaline, terminated by a very minute introrse basifixed anther, all glabrous, ovary short obovoid, glabrous, 4-lobulate; style very short, the brown stigma comparatively large and its 4 lobes rotately spreading, also glabrous. Infrutescence 3 to 8 cm long, branched from near the middle, divaricate; fruits dark green, conspicuously reticulate in the dry state, usually 1 to 3-clustered, subglobose though obscurely compressed, 4 mm across, persistent, apically dehiscent; seeds shining and nearly black.

Type specimen number 13844, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in stony ground of a very steep wooded slope of Cawilanan peak at 4500 feet altitude. "Leiva-an" is the Manobo name.

This is at once distinguished from *Melicope monophylla* Merr. and from its new variety *glabra* by its glabrous and smaller leaves.

***Melicope monophylla glabra* Elm. n. var.**

A small tree-like shrub; stem 13 cm thick, 5 to 7 m high, crooked, subterete; wood faintly yellowish tinged through-

out, with a pleasant odor, tasteless, light in specific gravity; bark smooth and yellowish; main branches few and toward the top spreading not numerous rebranched; twigs slender, suberect, the green and glabrous terminal portion obscurely angular. Leaves ascending, opposite, coriaceous, flat, paler green beneath, glabrous, elliptically elongated, apex rounded, in the mature ones broadly obtuse, curing unequally brown on the 2 sides, entire, 2 to 2.5 dm long by 9 to 12 cm wide at the middle, often with much reduced leaflets, very minutely black punctate beneath; petiole stoutly raised beneath, brown when dry; lateral nerves 9 to 13 pairs, the basal 2 to 3 pairs much less conspicuous from beneath, divaricate, coarsely forked and reticulated toward their distal ends, occasionally with secondary intervening ones, the reticulations beneath rather coarse yet relatively conspicuous; petiole including the petiolule 2 to 4 cm long, the longer portion or the petiole proper subterete, green and glabrous, the petiolule portion flattened and grooved along the upper side, the jointed portion enlarged and deeper green in the fresh state. Panicle lateral or axillary, usually single, in the bud state 5 cm long; branchlets subtended by bracts, mainly opposite, in the early state densely yellowish puberulent; buds globose, clustered; pedicel 1 mm long or less, subglabrous, the bracts puberulent; calyx 1 mm long, cup shaped, the basal one half united, terminated by 4 blunt teeth, glabrous though somewhat punctate; corolla longer, alternating with the calyx segments. Fruiting panicle 3 times larger than the inflorescence, branched from below the middle; pedicels 3 mm long, at the base surrounded by scale-like bracts or bract vestiges, all the branches divaricate, flexible, pale green; carpels much deeper green, somewhat verruculose, 4 mm long, obscurely flattened, apically dehiscent, persistent; seeds solitary, 2 mm in diameter, subglobose, shining black, hanging for a considerable time from the opened capsule before falling.

Type specimen number 13897, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected in wet rocky ground of densely wooded banks of the Catangan creek at about 3000 feet altitude.

Its entirely glabrous leaves mark it as a good variety

from the type specimen of the species.

***Murraya banati* Elm. n. sp.**

Shrubs; stem 5 to 10 cm thick, 3 to 5 m high, sub-erect, crooked and irregularly round, branched from below the middle; branches spreading, rebranched, the ultimate ones lax and descending; wood hard and heavy, yellowish throughout, finely grained in a parallel manner with the irregular surface, odorless and without taste; bark smooth, yellowish gray, avellaneus beneath the epidermis; twigs terete, the young green tips sparsely verrucose. Leaves descending, alternate, submembranous, nearly flat, the abrupt bluntly pointed apex recurved, the entire margins wavy, elliptic though usually the smaller ones ovately elliptic and the few larger ones obovately elliptic, composed of a single leaflet or alternately 2 to 3-foliate, varying from 1 by 3 cm large of the single leaf to the 5 by 10 cm large in the large obovate leaflets, base obtusely rounded in the ovately elliptic ones, broadly cuneate in the others, the terminal leaflet always much larger, glabrous, green in the dry state, minutely punctate on both sides; midrib conspicuous beneath, also green when dry; lateral nerves 5 to 7 on each side, oblique, anastomosing, reticulations evident; petioles also green even on the dry specimens, short, on the single leaves with the rachis varying from 5 to 15 cm in length for the 2 to 3-foliate leaves, glabrous but verruculose, upper side flat and laterally ridged, the lateral petiolule less than 5 mm long and darker green. Infrutescence laterally scattered along the branchlets, upon 1 to 2 cm long strict and verruculose peduncles; the peduncle at its distal end irregularly enlarged and bearing 1 to 3 fruits upon 1 cm long rather slender pedicels; fruits usually in pairs from the distal end of the green and flexible pedicels, pendant, fusiform, 2.5 cm long, sessile, soft, ruber red and with a sweet taste when fully ripe, 2-celled but usually with only a single seed.

Type specimen number 13947, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

In moist stony soil along wooded banks of the Catangan creek at 750 feet altitude. The Manobos as well as the Bagobos call it "Banati."

The gnarly basal portion of the stem or root portion is highly prized by the Mindanao tribes for the material in making ornamental handles for their larger weapons and for sheaths of their smaller knives. It takes a beautiful yellowish polish and pieces with curved and twisted wood grains are exceedingly fine.

Apparently not one of the numerous forms under *Murraya exotica* Linn. but very close to *Murraya elongata* DC., differing in the longer and more tapering fruits, leaves submembranous or chartaceous not coriaceous nor with notched tips.

***Tetractomia philippinense* Elm. n. sp.**

Small tree or shrub-like; stem several to 8 dm thick, 5 to 8 m high, subterete, crooked, mainly branched toward the top; wood bitterish, yellowish white, odorless, moderately soft; bark comparatively thick, grayish white mottled, smooth, the inner portion yellowish; main branches ascending, repeatedly rebranched; twigs lax, suberect, their greenish tips glabrous. Leaves normally opposite, crowded toward the ends of the branchlets, thickly coriaceous, ascending, much lighter green on the nether side which is also more evidently punctate, glabrous, curing very unequally brownish on the upper and lower sides, apex rounded and terminated by a blunt point, base cuneate, entire margins subinvolute in the dry state, obovately oblong or merely obovate, the average blades 6 cm long by 2.75 cm wide above the middle, frequently much smaller; midrib prominent and reddish brown when dry; lateral nerves 4 to 6 on each side and occasionally with secondary ones intervening, subdivaricate, relatively much less prominent, the faint basal pair very oblique and parallel with the margin, their tips more or less interarching, reticulations obscure; petiole 0.75 to 1.5 cm long, subcompressed or its sides ridged, punctate, appearing articulated at the distal end. Inflorescence erect or nearly so, 3 to 5 cm long, glabrate,

usually solitary from the upper leaf axils, few paniculately branched from above the middle; branches opposite, only the larger or lower ones rebranched, subtended by blunt glabrous bracts, bearing from the distal end 1 to nearly 3 odorless flowers; pedicels 2 to 3 mm long, glabrous, rather thick, subtended by a solitary or a pair of bract vestiges; calyx yellowish green, subcampanulately, glabrous, obscurely punctate, rigidly coriaceous, 1.5 mm across; the 4 segments united about the base, a trifle over 1 mm long, broadly ovate; petals cremeus, of an equal number, alternating with the calyx segments, in anthesis spreading, valvate, coriaceous, very broadly ovate, also glabrous, punctate, apex subacute, 1.5 mm long and equally as wide toward the base; stamens 4, alternating with the petals; filaments compressed, glabrous, gradually tapering from the base to the apex, 1 mm long at least; anther 0.6 mm long, elliptic, basifixed, base notched, apex truncately obtuse, sublaterally dehiscent; ovary crown truncate, glabrous, toward the center provided with 4 lighter colored cushion-like excrescences; style very short, stigma minute, all glabrous. Glandular capsule erect, 4-parted, rigid, glabrous, punctate; each division at least 3 mm long, oblongish, compressed though much thickened at the base, the apex 1.5 mm wide, inserted upon the apex and one third way down the dorsal side; inner carpel similar in shape, dehiscing along the suture all around, eglandular, hyaline and bony; ovules 2 in each cell, much flattened, sessile; seeds 2 but frequently only one maturing in each cell, 1.5 mm long, ovately elongated from the side view, compressed especially toward the apex which is extended into an oblongish wing as the seed itself, smooth, dark brown especially the seed portion.

Type specimen numbers 13702 and 13751, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Both of the above numbers were collected in the cold moss covered and wind swept ridges between the summit peaks of mount Urdaneta at 5500 to 5750 feet altitude. The former number was named "Yadagon" while the latter number the Manobos called "Aliayan."

Quite distinct from *Tetractomia majus* Hook. and *Tetractomia roxburghii* of the same author, the only species hitherto known of this Malayan genus.

SABIACEAE

***Meliosma tongcalingii* Elm. n. sp.**

A lofty tree; trunk 1.5 m thick, terete and straight, 20 m high at least; branches widely spreading, the young portion dark brown. Leaves 5 to 11 dm long, 12 to 20-pinnate, alternating toward the ends of the thick branchlets; leaflets subopposite, coriaceous, glabrous except the nerves beneath, the entire margins subinvolute, the recurved tip acute or abruptly acuminate, base rounded or subtruncate, ovately oblong, the basal ones much reduced, nearly 2 dm long and 7.5 cm wide below the middle, curing dull brown; midvein prominently raised beneath, fuliginous strigose even on the upper sunken side; lateral nerves 8 to 15 pairs, much ascending, tips faintly united, more numerous toward the base, divaricate, cross reticulations faint yet quite evident from both sides; petiolule similarly hairy, caniculate, 1 cm long; petiole proper 1 to 2 dm long, stout, terete or nearly so, brown, usually fuliginous puberulent, thickened at the base. Panicle terminal, creamy white or yellowish, 3 to 5 dm long, the main stalks as well as the branchlets densely covered with a short fuliginous pubescence; flowers solitary or in small groups, promiscuously scattered along the thick ultimate branchlets, sessile, subtended by short and similarly hairy bracts; buds obovoid, 2.5 mm long; calyx 1.5 mm long, erect and mostly united, obscurely 3-angled, truncate or minutely yet sharply 3-pointed, rigid, cup shaped; petals 3, valvate, thick, yellowish, also glabrous, slightly unequal in width, elliptic; stamens apparently only 2, glabrous, alternating with the petals, strongly inflexed from the apical end of the petaloid filament; anther introrse, broadly elliptic, nearly 1 mm long, wider, emarginate at the ends, ovary glabrous, ovoid and sharply pointed, subtended by a glabrous membranous rim or collar which is truncate or minutely pointed; the glabrous and

expanded filament with a pair of projections from the base, the connective extended into a rigid point.

Type specimen number 11929, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, October, 1909.

Collected in moist rich soil of a densely forested sheltered place at about 3000 feet altitude along the trail from *Datu Tongcaling's* settlement to mount Calelan. Named after the Bagobo chief who called this stately tree "Magasorod."

SAPOTACEAE

***Mimusops latericia* Elm. n. sp.**

An upright tree of middle size; stem terete though crooked, 2 to 3 dm thick, 12 m high, branched above the middle; wood very hard, burly, heavy, odorless and also without taste, the outer one third whitish, gradually changing to the incarnatus central mass; bark fumosus, deeply checked, testaceus except the epidermis and the inner whitish surface which exudes milky sap; main branches ascending, ultimately numerous rebranched; twigs terete, lax, suberect or ascendingly curved, their apical portion latericius lanose. Leaves descending, rigidly coriaceous, shining upon the upper deeper green and strongly folded side, duller beneath even in the dry state, curing dull or deep brown on both sides, chiefly toward the ends of the branchlets, alternate or in the early state subopposite, entire, oblong when old but the young leaves covered beneath with a deciduous latericius colored tomentum, much recurved toward the acute to subacuminate apex, base obtuse or obtusely rounded, variable in size, the larger blades 9 cm long by one third as wide across the middle; midrib prominent beneath, entirely glabrous when old, latericius pubescent beneath in the early state; lateral nerves oblique, faint, numerous, freely reticulated above the middle; petiole 1 to 1.5 cm long, nearly plane along the upper side, in the early state covered with latericius hairs, finally glabrous. Flowers divaricate, subpendant, usually solitary from the leaf axils; pedicels at first densely latericius tomentose, 1 cm long or longer, gradually tapering and becoming thicker toward the distal ends; bud

ellipsoid, latericius tomentose; calyx very thick and rigid, united at the base, the 4 outer calyx segments 8 cm long and one half as wide below the middle, broadly lanceolate or ovately elongated, apex acute, the thinner edges involute especially toward the apex, light pulverulent on the ventral side, ascending; the inner series of 4 sepals puberulent especially on the outer side, alternating and inserted upon the concrete basal portion of the outer series of segments, similar in shape though somewhat shorter; petals about 24, most of the outer ones broadly lanceolate, the inner 4 twice as broad but not longer, all glabrous and finely veined, 6 mm long including the 1 mm long united basal portion, creamy white, erect, densely crowded and imbricate; stamens about as long; the basal 1 mm rim-like and concretely united with the corolla base, with 8 fertile stamens alternating with hairy sterile ones; filaments subterete, glabrous, at least 1 mm long, tapering from the base to the apex, erect, in the early state curved, anther at least 3 mm long, sagittate and basifixed, nearly 1 mm wide across the base, gradually tapering to the acuminate point, the outer side along the connective with few long hairs, laterally debiscent; ovary bluntly conical, 3 mm long by 2 mm thick, hairy; style a trifle longer, glabrous, terete, obscurely curved, terminated by a truncate lighter colored stigma. Young fruits ovoid, 8 mm long and 5 mm thick, long latericius hairy, subtended by the rigid calyx.

Type specimen number 13010, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Collected in lightly wooded flats of black adobe soil at above 250 feet elevation.

This Palawan plant seemed quite distinct to me from *Mimusops elengi* Linn. collected in other localities. Its more numerous leaves are smaller and somewhat different in shape. Our specimens are densely latericius pubescent.

***Palaquium cuprifolium* Elm. n. sp.**

Only a small upright tree; stem 1 dm thick, 7 m high, terete, branched from the middle; main branches widely spreading, only sparingly rebranched, the ultimate tips

suberect, very rough and dirty scurfy; bark lateritious except the brownish more or less scaling surface, with latex; wood soft, odorless and tasteless, white and reddish tinged toward the center. Leaves alternately crowded toward the ends of the branchlets, chartaceous, ascending, duller green on the upper side, curing dark copper brown on both sides, glabrous except the midrib, 3 to 4 dm long by 12 to 16 cm wide above the middle, the entire edges minutely involute in the dry state, obovately oblong or cuneate, broadly rounded at the top and usually with a short blunt point, occasionally inequilateral toward the cuneate base, the very young leaves very densely fulvous hirsute; midrib very thick and large beneath, in the early state subfulvous beneath, ultimately glabrous, flat and with a middle ridge along the middle, yellowish when fresh, dark brown when dry; lateral nerves 15 to 18 on each side of the midrib, oblique, straight, ascendingly curved toward the apex and the upper ones more or less united, very prominent beneath, cross bars oblique, faint yet quite evident from beneath; petiole at most 3 cm long, very stout, flat and compressed, striate along the upper side, yellowish gray pulverulent, after falling leaving raised scars; stipular-like bracts chartaceous, 1 cm long, nearly glabrous, oblong to elliptic, grayish when old. Flowers out of season. Infrutescence clustered immediately beneath the foliage; pedicels arising from short tubercles or coarse excrescences, 1.5 to 2 cm long, scurfy or yellowish pulverulent, slightly and gradually thickened toward the distal end, more or less striate; fruit green, ellipsoid, smooth, glabrous, 2.5 cm long, often a trifle flattened, subtended by the segmented calyx, normally with 2 large shining brown seeds with plane ventral side, often with only 1 ellipsoid seed with a dull longitudinal zone along one side.

Type specimen number 13263, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Gathered in humus covered clay of a forested ridge at 1000 feet height. Its Manobo vernacular name is "Tacan."

Quite different from my number 13896 or the following new species collected in this same general region. Neither is it

Palaquium gigantifolium Merr. in the leaves and stipular bracts.

***Palaquium pinnatinervium* Elm. n. sp.**

Large and lofty tree; bole 10 dm thick in diameter, 20 to 25 m high, buttressed and almost entirely standing upon prop-roots, chiefly branched toward the top; main branches spreading and erect or ascendingly curved, numerous bracteate toward the glabrous tips; wood moderately hard, white though slightly reddish tinged toward the center, odorless, a trifle bitter; bark thick, reddish or purplish red toward the inner side, smooth and grayish brown on the surface, only roughened with longitudinal lines of excrescences, containing latex; bracts ovately lanceolate, 2 to 3 cm long, 1 cm wide across the base, greenish brown, strongly curved upward and twisting toward the acuminate point, usually a pair from each side of the petiole, glabrate. Blades 4 to 5 dm long and 15.5 cm wide above the middle, obovately oblong, broadly rounded at the apex, gradually narrowed toward the base or slenderly pandurate, at the base obtuse and 1 cm wide, entire edges subinvolute in the dry state, ascending, alternately crowded toward the distal end of the twigs, subchartaceous, shallowly folded upon the upper much darker green and glabrous surface, beneath finely yellowish brown puberulent or canescent; midrib yellowish green, similar in vestiture when young, ultimately glabrate, very stout and ridged beneath, yellowish green in the natural state, dark brown when dry, flat and a trifle sunken along the upper glabrous side; lateral nerves pinnatinerved, of 25 slightly ascending pairs, yellowish brown canescent, tips ascendingly curved, relatively prominent, oblique cross bars very numerous and obscure; petiole broad and very thick especially toward the base, 2.5 cm long, flat along the upper side, glabrous, nearly black in the dry state. Flowers not found. Fruits clustered along the branchlets, hanging upon recurved 3 to 5 cm long greenish brown glabrous pedicels; nuts short ellipsoid, lucid green, 3.5 cm long by 1.75 to 2 cm thick, subtended by the obscurely 3-lobed persistent calyx.

Type specimen number 13896, A. D. E. Elmer, Cabad-

baran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in rocky ground of the densely wooded Catangan creek at 3000 feet altitude. The Manobo name is "Tagcan."

The nether side of the leaves of *Palaquium gigantifolium* Merr. is glabrous and whose apices are acute to obtuse not broadly rounded as in ours.

***Payena fusicarpa* Elm. n. sp.**

A small or middle sized tree; stem 2 to 3 dm thick, 7 to 10 m high, subterete, branched from above the middle, quite hard, whitish, tasteless, with a faint pleasant woody odor, reddish tinged toward the center; bark brown and scaling in small plates, whitish on the inner side, with milky sap; main branches ascending, spreading, repeatedly and laxly rebranched; twigs also ascending or the outer and lower ones descending, the angular leaf bearing portion dark green and ascendingly curved. Leaves similarly disposed, chartaceous, alternate, darker green above, glabrous, the acute to acuminate apex recurved, occasionally obtuse at the apex, base obtuse or obtusely rounded, drying brown or blackish brown on the upper side, margins entire and when dry a trifle involute, oblong or the smallest ones broadly lanceolate to oblanceolate, the larger blades 2 dm long by 7 cm wide across the middle, the smaller ones less than one half as large, the slenderer tips subfalcate; petiole 2 to 3 cm long, caniculate along the upper side, glabrous, somewhat thickened toward the base, leaving raised scars after falling; midrib prominent beneath, shallowly grooved though with a ridge along the center on the upper side of the leaf, glabrous on both surfaces; lateral nerves 12 to 16 pairs, subdivaricate, ascendingly curved toward their ends and gradually disappearing, cross bars and reticulations obscure. Flowers odorless, in axillary clusters, upon 1.5 cm long glabrate to minutely puberulent recurved pedicels which are pale green and upon drying turning nearly black; calyx deep campanulate, 7 to 8 mm long, 5 to 6 mm thick, composed of 4 strongly imbricate segments or sepals; the 2

outer ones longer and broader, very thick and rigid, ventrally folded, appressed pubescent on the exterior, slightly so on the inner side, ovately elliptic when spread out, bluntly obtuse at the apex; corolla 5 mm long, the basal one half united into a broad tube, inserted about the base of the ovary, the upper portion 5 to 7-segmented; segments linear, 1 mm wide, glabrous, more or less rounded at the apex, frequently smaller and more pointed, its throat densely hairy, deciduous as a whole; stamens about 15, erect, inserted upon the corolla throat, apparently all fertile; filaments 0.5 mm long, subglabrous, gradually tapering from the base to the apex; anther 2.5 mm long, shallowly cordate at the base, mucronately pointed at the apex, ovoidly oblong, laterally dehiscent, the emptied cell walls widely spreading, basifixed; ovary crown flatly conical, pubescent; style strict, stout, 1 cm long, glabrous, terminated by a rugosely 3-angled stigma. Fruits usually solitary, descending, green, fusiform, 2.5 cm long and 1 cm thick, glabrous, subtended by the chartaceous enlarged and persistent calyx.

Type specimen numbers 14058 with flower and 13890 with fruit, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September and October, 1912.

The flowering specimens were collected on the windy wooded ridge connecting Duros and Cawilanan peaks at 3500 feet altitude; the fruiting material was gathered in wet gravelly or stony ground along a deeply shaded streamlet near the Catangan creek at 3000 feet altitude. The Manobo name for the former is "Malobon" or "Marobon" and of the latter "Silanangsang."

***Sideroxylon apoensis* Elm. n. sp.**

Tree; trunk 10 m high or higher, 0.5 m thick, branched toward the top; the twigs quite numerous, suberect, forming dense masses, at first pulverulent, ultimately glabrate, angular in the dry state; bark smoothish, gray and brown mottled, with a milky sap; wood hard, yellowish white, heavy, burly and yet when cut quite brittle. Leaves thinly chartaceous, the entire margins strongly curved upon the under side, dull ashy green above, otherwise paler in color,

alternatingly scattered along the branchlets or twigs, obovate or obovately oblong, rounded at the apex, base obtuse or abruptly cuneate, glabrous above, beneath very finely hairy or canescent, 1 dm long including the stalk, averaging 4 cm wide above the middle, frequently smaller ones are intermixed; midrib raised beneath, when young strigosely hairy, finally glabrate; lateral pairs of nerves 5 to 9, divaricate, subparallel, also pronounced beneath, tips anastomosing, shallowly sunken along the upper side of the blade, reticulations fine and equally evident from both sides; petiole 1.5 cm long, glabrous, subterete toward the base, subcompressed otherwise. Flowers clustered from the leaf axils, not odorous but with a sweet taste; pedicels green, scurfy brown or pulverulent, 7.5 mm long, scattered in all directions; buds globose, 4 mm in diameter, reddish brown puberulent but soon wearing glabrous; calyx of 5 nearly free and imbricate segments, more or less united about the base, roundish or oval, thick, curved upon the ventral side, glabrous, the inner 3 thinner especially the margins, 4 mm across, often wider than long, entire; buds globose; corolla of an equal number, united toward the base, ovately oblong or elliptic, whitish and with hyaline margins, numerous and finely veined, 3.5 mm long, 1 mm less in width, subequal, also glabrous, becoming detached as a whole; stamens 5, opposite the petals and inserted upon the basal portion; filaments erect, 1 mm long, expanded toward the base; anther a trifle longer, triangularly ovate, emarginate and basifixed at the base, dehiscing along the edges, the cells widely parted after shedding the pollen; ovary conically elongated, glabrous, 2 mm long, terminated by a 5-pointed stigmatic plate.

Type specimen number 10800, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Discovered on a steep wooded slope of mount Calelan at 4500 feet altitude. The native or Bagobo name is "Baloloy."

Apparently nearest related to my number 6071 collected in March, 1904, at Baguio.

***Sideroxylon urdanetense* Elm. n. sp.**

Lofty tree; trunk 12 dm through, terete, nearly straight, 20 or more m high, mainly branched toward the top; bark dark brown and scaling on the surface, testaceous otherwise; sapwood white and burly, hard, odorless and tasteless; main branches spreading, crooked, ultimately numerous rebranched; the rigid twigs erect, much roughened with raised leaf scars, the apical leaf bearing portion dark fulvus pubescent. Leaves clustered toward the apex of the branchlets, in whorls or subalternating, also ascending, quite rigid, shallowly folded upon the upper more or less shining dark green surface, much lighter green beneath, glabrous except the midrib beneath, curing brown on both sides, the entire edges subinvolute when dry, coarsely wavy toward the apex which terminates in a very short blunt point, obtuse or broadly cuneate toward the base, the smallest oblanceolate, the larger or normal ones oblanceolately oblong, 9 cm long without the petiole and one third as wide across the upper one half; midrib prominently raised beneath and in the fresh state yellowish brown, deeply furrowed above and light yellowish green, brown when dry, short canescent along the lower side; lateral nerves 9 to 11 on each side, very oblique, straight except the ascendingly curved tips, relatively conspicuous beneath, cross bars none or very obscure; petiole 2.5 cm long, furrowed along the upper side, grayish puberulent beneath, thickened toward the base, usually with small buds in their axils. Flowers not seen. Fruits solitary or in pairs from the leaf axils; pedicels divergent, fulvus pubescent, as long as the petioles, gradually thickened toward the distal end; nuts dark vinous when fully mature, subtended by a whorl of imbricated 5-segmented persistent calyx, obovoidly ellipsoid, 1.5 to 2 cm long, glabrous and shining, mucronately pointed at the broadly rounded apex; calyx segments fulvus on the outside, rigid, almost 5 mm long, ovately rotund.

Type specimen number 14161, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in humid forests about lake Danao at 5000 feet altitude and in wet somewhat stony ground. "Bobonau" is the Manobo name.

Sideroxylon angustifolium Merr. but our leaves have fewer nerves and the smaller fruits are upon longer pedicels.

SAXIFRAGACEAE

***Dedea cinerea* Elm. n. sp.**

Small and rather slender trees; stem subterete, 8 m high, 2 dm thick, terete or subterete, branched from above the middle or toward the tip; wood odorless and tasteless, moderately hard or soft, sappy white, becoming reddish tinged upon exposure; bark thick, grayish white and lenticelled on the surface, light testaceous otherwise; main branches erect, freely rebranched toward the top, comparatively short; twigs ascending and greenish, grayish white pulverulent or glabrate along the apical portion. Leaves also ascending, quite rigid and subchartaceous or subcoriaceous, the entire edges subinvolute, shallowly folded upon the upper much deeper green surface, curing lighter brown beneath, usually densely clustered toward the end of the branchlets, alternate when scattering, otherwise subopposite or in subwhorls, minutely glandular punctate and grayish brown when old beneath, oblong or obovately so, the average blades 8 cm long by 2.5 cm wide across the middle or a trifle above this, obtusely rounded at the apex, base obtuse or subcuneate; midrib strict and ridged along the under side clear into the apex, deeply caniculate and yellowish gray pulverulent, dull brown when dry; lateral nerves 9 to 13 on each side, divaricate, straight except the ascendingly curved tips, obscure even beneath, reticulations and secondary nerves very obscure; petiole yellowish gray pulverulent, averaging 1.5 cm long, grooved along the upper side. Spikes solitary from the leaf axils, subterect, equalling the foliage, dark reddish brown when dry, greenish when in the fresh state, flower bearing from below the middle, the rachis proper striate or angular; flowers alternately scattered and in subwhorls, odorless; pedicel 2.5 mm long, strict, cinereous-

ly scurfy or glandular; calyx 1.5 mm long, 1 mm wide across the top, with 4 short roundly pointed teeth-like segments, covered on the outside with a crust of a yellowish white glandular mass; petals of an equal number and alternating with the calyx teeth, inserted upon the calyx rim, membranous, glabrous, becoming reflexed, 2 mm long by 1 mm wide, oblong, base truncate, apex roundly so; stamens erect, persistent, alternating with the petals; filaments coriaceous, very broad, glabrous, erect, 0.75 mm long by 0.66 mm wide, pointed at the apex; anther striangularly ovate, inwardly curved, 1 mm long and equally as wide across the truncate base, glabrous, dark reddish brown in the dry state, rounded at the apex, flattened, opening along the lateral edges, basifixed; ovary crown rugose or ridged, light cinereous, extended into a similarly colored short thick style; stigma rugosely 2-lobed, dark reddish brown, glabrous.

Type specimen numbers 13696 and 13749, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected both numbers in the densely wooded and humid depression between the summit peaks of mount Urdaneta at 6000 feet altitude. According to the Manobos the first number is called "Calipayan" and the latter number "Bitagan."

Spike and flowers are more glutinous in *Dedea apoense* Elm. and the exerted portion of the ovary with the style are distinctly cinereous in our present material.

***Hydrangea cuneatifolia* Elm. n. sp.**

A lofty tree climber or rather epiphytic on them; stems and branches forming more or less rigid clumps, the free branches hanging, the flowering twigs ascendingly curved. Leaves coriaceous, with recurved obtuse or acute tips, opposite, scattered along the young fulvus stems, margins entire, obovately oblong, cuneate at the base or only occasionally obtusely rounded, glabrous, somewhat paler green beneath, drying brownish, the larger blades 15 cm long, 6 cm wide above the middle; midvein brown and prominent beneath, the 5 to 7 lateral pairs very oblique and arcuate, all smooth

except the small glandularly hairy axillary tufts, reticulation fine and more evident from beneath; petiole 2 to 3 cm long, densely covered on the upper flattened surface with short stellate tuftlets of hairs. Peduncle stout, obscurely angular, 3 to 5 cm long or much shorter, short brown scurfy or hairy, perceptibly thickened at the distal end; main branches several, 5 cm long, horizontally spreading, branching from near the base, slightly zigzag from the place of branching, densely fulvus; globose involucre in the bud 3.5 cm in diameter; the subtending bracts 3 or more, smooth and yellowish white on the inner side, densely brown felted on the outside, succulent and falling very early; the outer or terminal flowers sterile and with creamy white petaloid appendages measuring 15 mm long; corolla whitish, delicate, caducous, adnate, falling in tact but ultimately becoming separated into 4 petals from the base, 2 mm long, truncately oblong; calyx smooth, subglobose, 2 mm across, minutely 5-denticulate; stamens 10; filaments free, glabrous, inwardly curved from above the middle, 2.5 mm long; anthers 0.5 mm long, broadly elliptic, basifixed, emarginate at both ends especially at the apex; ovary entirely encased by the calyx, with a rim-like disk; style also glabrous, usually 2 and free, 1.25 mm long, the apical stigmatic crest outwardly bent and mostly puberulent; ovules numerous in each of the 2 compartments; mature fruit not seen.

Type specimen number 10732, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

In dense forested flats from 3000 to 4000 feet elevation. The Bagobos call it "Takir." The fallen bracts were frequently met under trees but the plant usually inhabits the uppermost limbs of lofty or giant trees and clear out of sight of the traveling botanist.

A very close relative of *Hydrangea glandulosa* Elm. and together they may form a new genus.

***Spiraeopsis philippinense* Elm. n. sp.**

Tree; trunk 5 dm thick, subterete, bent or suberect, 12 m high or higher, chiefly branched toward the top; wood white, soft, light in weight, odorless and quite taste-

less; bark thick, minutely checked longitudinally, rather light or yellowish gray on the epidermis, otherwise exactly ferrugineous; main branches widely spreading and forming a flat crown, crookedly rebranched; twigs short and suberect, subglaucous green, blackish when dry, not numerous, yellowish gray pulverulent at the apical young portion. Leaves opposite, horizontally spreading except the young ones, shallowly folded and glabrate upon the upper surface, yellowish green beneath and grayish in the dry state, 1.5 to 2.5 dm long, 7 to 9-imparipinnate, the basal or smaller leaflet 3 to 5 cm from the base; leaflets elliptic or more commonly ovately elliptic, the larger ones 1 dm long by 5.5 cm wide across the middle, the rounded basal portion entire, otherwise obscurely serrate, the edges somewhat curved upon the nether pellucid glandular and glabrate side, apex abruptly acute and recurved, the terminal leaflet cuneate at the base; midrib curing ater, puberulent on both sides, ridged beneath, sunken above; lateral nerves 7 to 9 on each side of the midrib, subdivaricate, ascendingly curved, reticulately branched at their distal ends, also prominent and puberulous beneath and of the same color, cross bars quite plain beneath; petiole and rachis suberect, pulverulent, ater when dry, the lateral extended 1 cm beyond the upper pair of opposite leaflets, lateral petiolules only 1 to 2 mm long or none; stipules sessile, subrotund in shape, the larger ones 2 cm across, persistent, foliaceous, margins strongly curved upon the nether yellowish gray and veiny side, frequently becoming parted from the apex toward the base. Inflorescent panicle ascending from the leaf axils, exceeding them, 2 to 4 dm long including the peduncle which is one third to one fourth the length, 1 to 2 dm wide toward the middle, the branches profusely rebranched from below the middle; stalks ebracteate, yellowish gray puberulent, the peduncle and lower branches when old nearly glabrous and ater brown or black when dry; pedicels 1.5 to 2 mm long, terete, short pubescent, thickened toward the base, without subtending bracts, usually in false clusters; buds 1 mm in diameter, globose; perianth 5-segmented, thickly coriaceous, remaining bowl shaped, the basal one third united; segments valvate, 1.25 mm long, ovately oblong and with

acute apices, pubescent below the middle on the exterior, puberulent on the same side toward the apex; stamens 10, inserted upon the basal inner portion of the perianth, much exerted in anthesis; filaments 1.5 mm long, filiform, glabrous; anthers oval, basifixed, with an obscure point at the apex, emarginate at the base and eventually becoming lobed, 0.33 mm across, laterally dehiscent, the empty cells persistent and wing-like, spreading; ovary sessile, of 2 contiguous carpels, ovoid, 0.75 mm long, densely hairy; the 2 glabrous styles very short and recurved, bearing small terminal stigmas; capsules 3 mm long, terete, 1 mm thick, a trifle thicker at the base, yellowish gray pubescent, subtended by the persistent perianth and bearing the equally persistent more or less elongated erect or only slightly curved or twisted styles, dehiscing from the base toward the apex, the inner plane side glabrous and open along the median line, the sides rigidly cartilaginous; seeds several or more in each carpel, flat, dark brown, glabrous, elongated bean shaped, 1 mm long, 0.33 mm wide, with a somewhat oblique and unequal membranous pair of wings which are brown and 0.5 mm long.

Type specimen number 14157, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected on a rocky forested ravine near the summit ridge a little beyond Cawilanan peak at 5000 feet elevation. "Bognag" in Manobo.

Our leaves are smaller, whiter and more glandular beneath than in *Spiraeopsis celebica* (Blm.) Miq. Both the inflorescence as well as the infrutescence are covered with lighter colored hairs, while the capsules are slenderer and more tapering above the middle to the pointed apex.

SIMARUBACEAE

Harrisonia citrinaecarpa Elm. n. sp.

Subscandent and sprawling; stem terete, 5 cm thick, branched toward the top; wood soft, with a large pith, slightly reddish tinged; bark gray or dirty brown and scaling

in thin plates, quite thick, similarly colored beneath the epidermis, inner side whitish, provided with thickly plaited spines; branches very long, spinescent, drooping, the ultimate ones relatively short and suberect; twigs reddish brown and light gray lenticelled, the young apical portion short pubescent. Leaves alternate, mostly horizontal, 1 to 2 dm long, imparipinnate; petiole only a few cm long, furrowed or grooved along the upper side, short pubescent, the rachis very similar; leaflets 5 to 13, membranous, their sides inequilateral except the terminal one, the obtuse to acute or even acuminate apex recurved, the basal leaflets usually smaller and ovately elliptic, the upper ones ovately oblong, sessile or subsessile, entire around the rounded or truncately rounded base, otherwise usually crenate or subentire, the average 4 cm long by nearly one half as wide diagonally across the middle, glabrous and somewhat shining on the upper surface, nerves and reticulations beneath sparsely pubescent or puberulent; midrib bold and soft hairy beneath, puberulent in its small channel upon the opposite side; lateral nerves 5 to 8 on each side, divaricate from and relatively prominent at the midrib, coarsely reticulated toward their distal ends, otherwise reticulations obsolete. Inflorescence terminal and erect, odorless, only few and short paniculately branched, 1 dm long or shorter or longer, short pubescent; the ascending branches occasionally subtended by solitary leaves or leaf-like bracts, rebranched above the middle, the lower branches of the larger branches subtended by oblanceolate bracts, the ultimate branches subtended by much reduced linear though similarly pubescent bracts; pedicels 5 to 8 mm long, puberulent, subtended by bracteoles, strict; bud truncately ellipsoid; calyx pulverulent, red, small, thick, disk-like, 5-toothed; corolla inserted upon the coriaceous calyx, the 5 or 6 segments nearly free, submembranous, widely spreading or reflexed, unequally in width, oblong, 2 to 4 mm long, at the apex a trifle truncate and puberulent, reddish brown on the outside, greenish on the upper side, yellowish when dry; ovary bright red, short ellipsoid or subglobose, 3 mm across, glabrous, fleshy, vertically rugose below the middle, longitudinally rugose above the middle, surrounded by the contiguous light pink fil-

ament bases; style also fleshy and glabrous, terete, 5 mm long, terminated by a slightly enlarged more or less rugose and pulverulent stigma; filament rim 3 mm high; each of the 12 parts flattened and covered with a woolly indument, strongly curved at the base and widest at the top; the free portion of the filament 7 mm long, subterete, white, glabrous, arising 0.5 mm below the tip of the woolly basal segments, pointed at the apex; anthers pale yellow, 1.75 mm long, elliptic, widely lobed at the base, basifixed, laterally dehiscent, obtusely rounded at the apex. Fruits pendant from the green stalks, yellowish green when young, turning citrinus after falling and upon the ground, flatly globose or button shaped, 1.5 to 2 cm across; the 6 stony seeds brown and imbedded in the meat.

Type specimen number 13448, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Subscandent and sprawling shrubs among the woods of the sand gravelly banks of the Catangan creek at 1000 feet above the sea. "Dagyangas" is the Manobo name.

Only critically distinguished from *Harrisonia perforata* (Blco.) Merr. by the larger more numerous and pubescent leaflets and by the 6-seeded larger fruits.

SOLANACEAE

Solanum anisophyllum Elm. n. sp.

An ascending or suberect shrub; stem 1 dm thick, 3 m high, subterete, branched from the middle; wood odorless and tasteless, dingy or yellowish white, moderately soft; bark smooth, yellowish gray, with a green hypodermis; main branches spreading, crooked or curved, not numerous-ly rebranched; twigs short or long and slender, frequently descending and gracefully curved toward the tips, glabrous, greenish, densely covered with yellowish white lenticels or excrescences. Leaves scattered, opposite, copious, the pairs very unequal in size and shape, membranous, mostly horizontal, glabrous, curing deep brown on both sides, paler green beneath when fresh, sublucid above, entire;

the larger blades averaging 6 cm wide across the middle and 15 cm long, oblong, the sharply acuminate apex recurved and a trifle falcate, inequilateral toward the obtuse base; smaller blades ovately rotund, averaging 6 cm long by 4 cm wide a trifle below the middle, bluntly apiculate at the apex, broadly rounded at the base; petiole of the larger leaves 1.25 cm long, only 3 mm long in the smaller ones, glabrous or when young hairy beneath, blackish brown when dry, prominently grooved along the upper side; midnerve green, yellowish brown in the dry state and quite prominent beneath, caniculate on the upper side toward the base, when young slightly hairy; lateral nerves 8 on each side of the larger leaves, subdivaricate and ascendingly curved, the tips of the upper ones interarching, the smaller blades with only one half as many nerves, the few cross bars and coarse reticulations evident from beneath only. Flowers odorless, 1 to 3-clustered from the leaf axils, each cluster usually provided on each side with a linear leathery caducous light tawny pubescent stipular bract 5 mm in length; pedicel slender, at least 1.5 cm long, glabrate or cinnamon brown puberulent, gradually thickened toward the calyx and merging into it; calyx turbinate, 3.5 mm long and as wide across the truncate apex, angular by the keeled midrib of the 4 quarters, these keels extending from above the middle of the calyx into an ascendingly curved hook-like tooth 1 mm in length, glabrate or pulverulent; corolla in the bud state elongated, glabrous, narrowed toward the face; segments 4, valvate in the early state, narrowly oblong, 2 mm wide across the middle, 8 mm long, the basal one third united, coriaceous, apex obtuse and narrowly appendaged on the inner side; stamens 4, alternating with the corolla segments and inserted upon their bases; filaments less than 1 mm long, glabrous, broad and fleshy; anthers erect, somewhat flattened or angular, 4 mm long, basifixed, 1.25 mm wide, at the base gradually extended into the filament or narrowly lobed, the truncate apex sterile and of more membranous folds, dehiscing along the inner sides; ovary small, well inserted at the base of the calyx, glabrate, stigma apparently sessile.

Type specimen number 13887, *A. D. E. Elmer*, Cabad-

baran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in wet gravelly earth among bowlders along a deeply shaded streamlet near the Catangan creek at about 3000 feet altitude. According to the Manobo "Cahodon" is the vernacular name.

Manifestly nearest related to *Solanum lagunense* Elm. yet distinguished from it in being more glabrous, inflorescence not cymose and by the distinctly anisophyllous leaves.

***Solanum mindanaense* Elm. n. sp.**

Perennial; stem 1 m long, nearly erect, only sparingly rebranched, dark green, subterete, crooked, densely pulverulent especially toward the top. Leaves in unequal pairs from the same side, widely scattered, horizontally spreading, gradually tapering toward the recurved acuminate apex, toward the base rather abruptly cuneate or attenuate, membranous or subcoriaceous, lighter green below even so in the dry state, soft puberulent on both sides, exceedingly variable in size, entire, the smaller ones broadly lanceolate, the larger ones ovately elongated, the average 14 cm long by 5.5 cm wide a trifle below the middle; petiole varying from 5 to 15 mm long, puberulent, somewhat flattened and strigose along the upper side; midrib rather broad beneath especially toward the base, very little grooved on the upper side at the same end, curing yellowish brown and puberulent; lateral nerves of the normal leaves 4 to 6 on each side, much ascending and curved, quite evident from both sides, cross bars relatively faint. Flowers axillary, usually 3-clustered, subtended by a 5 to 7 mm long linear coriaceous sulphureous pubescent caducous recurved bract; pedicel 8 mm long, glabrate or puberulent, subcoriaceous, gradually extended into the calyx; calyx turbinate, 4 to 5 mm long excluding the spur-like segments, puberulent or subglabrous, frequently glandular dotted, at the truncate apex with 5 radially spreading points which are the extension of the midvein; segments also puberulent, terete or subterete, 0.5 mm long, green as is the united calyx portion, persistent; corolla 8 mm long, the basal one third gla-

brous and broadly united into a tube; segments 5, alternating with the calyx extensions, ovately oblong, submembranous, the blunt acutely pointed apex usually recurved and somewhat twisted, densely puberulent along the thickened edges, otherwise glabrate, more or less light glandular on the outside, divaricately spreading; stamens 5, erect, alternating with the corolla segments and inserted upon the throat; filaments glabrous, 1 mm long, flattened, erect; anthers 3.5 mm long, 1.5 mm wide, oblong, basifixed, broadly notched at the base, with a pair of apical pores on the inner side a trifle below the obtuse apex, erect and contiguous; ovary conical, 2.5 mm long, 1.75 mm thick, smooth and glabrous; neck 4.5 mm long, also glabrous, terete, 0.5 mm thick; stigma capitate, slightly enlarged.

Type specimen number 13828, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Gathered from nearly decayed large timbers lying upon wet earth of an open gulch in dense forests about lake Danao at 5000 feet elevation.

Solanum crassipetalum Wall. but our specimen seem to differ from the descriptions in a number of minor characters. Number 13881 from this same general region was also distributed under this new name yet I really believe it to be a distinct species. To be compared with *Solanum biflorum* Lour. and *Solanum denticulatum* Blm.

THEACEAE

***Adinandra apoense* Elm. n. sp.**

A rather large tree; trunk 6 dm thick, 15 m high; branches chiefly above the middle, forming an elongated crown, the glabrous twigs relatively short and numerous; wood whitish or turning brownish toward the center, moderately soft; bark brown, gray on the branchlets. Leaves rigidly coriaceous, elliptically oblong or ovately so, glabrous, shining green above, much paler green beneath, curing unequally dull brown on its 2 sides, alternate, copious, the edges slightly recurved at least in the dry state, entire to-

ward the obtusely cuneate base, otherwise obscurely and crenately serrate, apex broadly rounded and occasionally emarginate, at least 5 cm long, one half as wide across the middle or a trifle above it; midrib black, glabrous, prominently raised beneath, well sunken along the upper side; nerves divaricate, about 7 to 9 pairs, relatively faint beneath, their tips reticulately united, frequently with secondary ones intermixed, reticulations few and obscure; petiole 5 mm long, glabrous at least when old, nearly black in the dry state, shallowly grooved above; bud bract minute, pubescent. Flowers pendulous, upon recurved green and rigid 1 to 1.5 cm long pedicels, odorless; calyx erect, thick, glabrous, imbricate, nearly free and 1 cm long, the 5 lobes short ovate, margins thin, the inner surface smooth and blistery, roughened on the outer exposed sides; petals of the same number, 1.5 cm long, imbricate and the basal portion united, 7.5 mm wide, truncately oblong, appearing glandular on the smooth inner surface, olivaceous on the middle upper or exposed portion, glabrous otherwise, irregularly rounded at the apex, veiny; stamens numerous, very unequal in length, inserted upon the petals 2 mm from the base; filaments 6 mm long or the inner ones less in length, ciliate pubescent; anthers 3.5 mm long, lanceolate, a trifle compressed, the connective densely hairy along the back and only sparsely so on the inner side; ovary glabrous, one half imbedded; style 1.5 cm long, glabrous, thick, terete, terminated into a small apical stigma.

Type specimen number 11265, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Discovered in rich moist humus covered soil of dense forests at 3750 feet altitude along the Burebid range. It is not surprising that the Bagobos call it "Malagsam" a name applied to a number of species of *Eugenia*.

***Adinandra merrillii* Elm. n. sp.**

Rather large trees; trunk 1 m thick, 18 m high, branched from the middle or above it, terete except toward the base; wood moderately soft, white or whitish, quite without odor or any taste; bark gray and smoothish, otherwise brown

except the inner sappy white portion; main branches finally numerous rebranched, spreading and crooked; twigs sub-erect, relatively short, quite rigid and tough, numerous, the greenish glabrate tips turning blackish when dry. Leaves ascending, rigidly coriaceous, copious, alternate, almost flat, pleasing shining green above, very much paler or yellowish green beneath, the entire edges a trifle involute when dry at least, curing unequally brown on the 2 sides, rounded at the apex, base obtuse or widely cuneate, the larger ones 6 cm long and one half as wide, the smallest leaves one half as large, obovately elliptic, more or less punctate on both sides; midrib prominent and dark brown when dry beneath, deeply grooved the full length along the upper side; petiole 5 mm long or longer, drying nearly black, glabrous, caniculate along the upper flattened surface; lateral nerves comparatively faint, 5 to 7 and with a few additional secondary nerves intervening, straight, ascending, forked toward their distal ends, evident from both sides, reticulations numerous. Flowers upon green and glabrous more or less recurved 1.5 to 2 cm long pedicels which arise either from the leaf axils or opposite them; calyx subtended by a pair of broad thick glabrous 3 to 4 mm long bracts; sepals united toward the base, glabrous, thick, imbricated into a cup, nearly 1 cm long, the outer 2 enclosing the inner 2, ovately rotund, margins relatively thin and numerous punctate; petals about 5, veiny, elliptic, 1 to 1.5 cm long, thinner in texture, the basal 2 mm united into a broad tube, glabrous except the throat; stamens more or less grouped and inserted opposite the inner petals upon the tube, about 3, apparently all fertile though somewhat unequal in length and size; free portion of filaments varying from 1 to 3 mm in length, densely yellowish brown hairy especially at their ends, fleshy, subcompressed, becoming thicker or wider toward the distal end; anthers 3 mm long, auriculate at the base, broadly lanceolate, gradually tapering to the acute point, basifixed, pubescent along the back, cells apparently unequal and ventrally dehiscent; ovary flatly globose, 3 mm in diameter, very lightly woolly; style at least 1 mm thick by 6 mm long, glabrous or as the ovary very lightly woolly; stigma terminal, small.

Type specimen number 14088, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Gathered in the humid lake Danao forested basin at 4750 feet altitude. The native or Manobo name is "Sangnanan." Dedicated to *E. D. Merrill*, botanist in the Bureau of Science and associate professor of botany in the University of the Philippines.

To be classified nearest to *Adinandra loheri* Merr.

***Adinandra robinsonii* Elm. n. sp.**

A middle sized tree; stem 10 m high, 2.5 dm thick, branched from below the middle and forming an elongated crown; branches comparatively short, divaricate, laxly rebranched, the ascending twigs dull olivaceous strigose; wood whitish, soft and without odor or taste; bark brown, smoothish. Leaves copious, subchartaceous, alternately scattered along the twigs, slightly ascending, the acuminate tips recurved, base acute or obtuse, narrowly oblong or oblanceolately oblong, entire toward the base, otherwise with fine crenate teeth, edges subinvolute in the dry state at least, 7.5 cm long and 2 cm wide or smaller, drying grayish green, beneath strigosely pubescent in the younger state; midrib prominent and strigose beneath, smooth and very shallowly grooved along the upper side; the lateral nerves oblique, strict, very obscure, reticulations obsolete or nearly so; petiole 3 mm long, strigose, channeled along the upper side; bud bract densely olivaceous strigose. Flowers upon pendulously recurved pedicels, either solitary or in pairs from the leaf axils; pedicel slender, 2.5 cm long, sparsely yellowish strigose, slightly enlarged toward the distal end, greenish, terete; calyx thick, closely imbricate, the 5 lobes united at the very base, the outer exposed portion hairy, glabrous on the deeply concave side, shortly ciliate and minutely apiculate, ovate, the outer basal ones shorter, the inner ones gradually becoming petaloid, veiny; petals also imbricate, 1 cm long erect, olivaceous hairy on the outer exposed side, otherwise glabrous, 5 mm wide, also veiny, truncately obtuse at the apex; stamens erect, in a rim and in-

serted upon the petals 1 mm from the base; filaments 2 mm long, also glabrous, obscurely compressed: anthers narrowly oblong, as long, somewhat compressed, the connective especially hairy along the outer side and produced into a prominent 1.25 mm long point; ovary sparsely hairy, globose-ly ellipsoid, 3 mm in diameter; style thick, terete, 7.5 mm long, strict, bearing a small flattened stigma.

Type specimen number 11461, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Collected in a densely moss laden humid forested flat at 6750 feet of mount Apo. My Bagobo companion called it "Marintok."

Very near to number 1369 *Williams* the type of *Adinandra elliptica* *C. B. Rob.* Named after the late *Dr. C. B. Robinson* who lost his life in Amboina.

***Adinandra urdanetense* Elm. n. sp.**

Lofty tree; trunk 12 dm through, 20 m high or higher, its main branches arising from above the middle, terete, wadded toward the base, somewhat crooked; twigs erect or ascending, relatively short, the green apical portion dull brown when dry, glabrous. Leaves alternate, similarly spreading, rigidly coriaceous, also glabrous, deeper brown on the upper side when dry, entire, flat or shallowly conduplicate on the upper deeper green side, somewhat recurved, obtuse or obtusely rounded at the apex, base cuneate, obovate or obovately elliptic, the larger blades averaging 6 cm long by one half as wide above the middle; petiole 1.25 to 2.25 cm long, caniculate, glabrous, blackish brown in the dry state, easily separating upon drying, the leaf sides a trifle decurrent at the upper end; midrib prominent, grooved along the upper side, similar beneath in the dry leaves; lateral nerves 5 to 7 on each side, ascending, very obscure, cross bars and reticulations obsolete. Flowers not seen. Fruits suberect, lateral but usually just above the leaf axils, solitary or in irregular whorls, subglobose or ovoidly globose, whitish or very pale yellowish green, smooth, glabrous, 1.25 cm thick, dark brown when dry, terminal, 2-celled, about 12 seeds in each cell; seeds achene-like, 4 mm long, whitish

on their outer sides, reddish on their angled inner surfaces; calyx persistent, glabrous, rigid and thick, about 7-segmented much smaller and pointed, the inner or larger ones rounded.

Type specimen number 14078, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected along the heavily forested ridge trail just beyond the summit of Cawilanan peak at 5000 feet elevation. This also the Manobos call "Sangnanan."

Differentiated from *Adinandra montana* Merr. by its shorter branchlets, much shorter bud bracts, leaves more rounded at the apex, fruits more nearly globose, outer calyx segments or bracts persistent, the inner segments hyaline margined not ciliate.

***Thea reticulata* Elm. n. sp.**

Small and slender tree; stem terete or wadded at the base; 2 dm thick, 12 m high; wood soft, yellowish tinged especially the heartwood, odorless, bitterish, light in specific gravity; bark thick, lateritious except the greenish gray and brown mottled smooth surface; main limbs from the middle, divaricate, slender, rebranched, the apical young portion grayish green or yellowish pubescent. Leaves alternating, chartaceous, deep green above, much paler beneath, flat, horizontal or the terminal ones descending, greenish when dry, obovately oblong, entire, the edges brown bordered, much wavy or rugose, obtuse at the base, truncately rounded the at top and terminated by an abrupt sharply pointed 5 to 8 mm long recurved apex, the larger ones 2 dm long by 8 cm wide above the middle; midrib much raised beneath, sparsely strigose along the dull reddish brown nether side, well caniculate and glabrous along the upper lighter green surface; petioles 1 to 1.5 cm long, very thick, ater when dry, flattened along the upper glabrous side, otherwise strigose but ultimately glabrate; lateral nerves numerously interlaced with the conspicuous reticulations especially prominent from beneath. Flowers upon 3 to 8 cm long stalks, the shorter occasionally unbranched, the longer only spar-

ingly rebranched, stout, when young densely yellowish gray strigose, more or less roughened; flower pedicels averaging 2.5 cm long, usually recurved, densely tomentose; flower star shaped, rigid, subpendulous, odorless; bud globose, 1 cm in diameter; calyx valvate, separating from the apex, 1.25 cm long, the basal one third rather broad and united; the 5 segments unequal in width, triangularly elongated, acute at the apex, very thick and rigid, entire margins slightly folded upon the ventral surface, tomentose on the outside, the inner side densely covered with long yellowish hairs, persistent, rotately spreading; petals filamentous, about 40, glabrous, basal portion united in a fleshy rim and inserted around the base of the ovary, immediately surrounding the stamens, in the early state curved inwardly, the distal one half or more ultimately becoming separated and tapering to a slender point, averaging 5 mm long, blackish brown in the dry state; stamens numerous, erect, inserted upon a densely ciliate torus; hairs 2 mm long, yellowish; filaments filiform, 3.5 mm long or longer, glabrous, flesh color, the outer ones shorter at least in the early stages, attached to the anther from the distal end; anther in the young state folded down along the filament, ultimately spreading, each one half 2 mm long, subcompressed, fluted on the outer side, becoming divided from the base toward the distal end, glabrous, 0.75 mm wide, ends truncate; ovary conically rounded, brown hairy; style slender, 1 to 1.5 cm long, pubescent except the upper portion; stigma short clavate or subcapitate. Fruit pedicel, 2 cm long, 5 mm thick, terete, glabrate, dark green, more or less lenticelled, 1.25 cm across the torus; fruit irregularly globose, pendulous, of all sizes, green but yellowish brown scale covered and roughened, the larger ones 6 cm in diameter; carpels thick, dehiscing from the apex toward the base in 5 parts.

Type specimen number 13478, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Discovered upon a steep and densely forested slope along the southwestern side of Duros peak or along the trail toward the summit of that peak at 3000 feet altitude. "Mag-sudod" in Manobo.

Judging by the fruits alone the author had no doubt of it belonging to the genus *Thea* though the flowers are very curious. It may prove to be a new genus or belong to some other family.

THYMELEACEAE

***Phaleria axillaris* Elm. n. sp.**

A low and spreading undershrub; stem terete but crooked, quite rigid, tough, 1.25 cm thick, about 1 m high, oppositely branched toward the top; wood whitish, with a whiter colored pith, tasteless, vile in odor; bark smooth, yellowish gray on the surface, greenish otherwise; branches horizontal, unbranched. Leaves similarly spreading, thinly coriaceous, membranous, much lighter green beneath; only the abruptly acute tips recurved, curing nearly equally brown on both sides, entire, obtusely rounded or subcuneate at the base, glabrous, oblong, oppositely scattered along the greenish branches, the average blades 1.5 dm long by 6 cm wide across the middle or above it; midvein rather prominent beneath, narrowly grooved above, darker brown in the dry state; lateral nerves 7 to 9 on each side, ascending and little curved, tips of the upper ones at least faintly interarching, reticulations barely visible under a lens; petiole 1 cm long or less, flattened and shallowly grooved above, glabrate, dark brown when dry; interpetiole also glabrate when old, 5 mm long, broad at the base, extended into a sharply acuminate point. Infrutescence in axillary clusters; stalks 5 to 15 mm long, the longer ones usually branched, all arising from a short and thick common stalk, ultimately glabrate, the branches subtended by persistent bracts, the slender fruit bearing pedicel bibracteate at about the middle and usually ascendingly curved; pseudostalk 3 mm long or twice as long, one half as wide, compressed, rigid, puberulent, terminated at the distal end by a pair of short very thick and acute bracts; pedicel 1.5 mm long or longer, subterete and thinner though becoming somewhat enlarged in the fruiting state; fruit glabrous, obscurely and angularly

ovoid, terminated by 4 persistent minute calyx or perianth segments, 1.25 cm long, 1 cm wide below the middle, yellowish when mature though eventually turning red, berry-like, 4-celled, apparently 4-seeded.

Type specimen number 13883, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Only one plant of this little upright undershrub was found in a humus covered rather dry soil of deep woods along a ravine of the Catagan creek at 3000 feet altitude. "Dahingyoyon" in Manobo.

Resembling *Phaleria cumingii* Vil. yet it may prove to be a species of *Rubiaceae*.

TILIACEAE

Grewia pyriformis Elm. n. sp.

Small or medium sized tree; trunk 3 dm thick, subterete and suberect, 8 m high, branched from the middle; wood soft, maple white, odorless and without taste; bark smooth and mottled, brownish white otherwise; main branches rather long and widely spreading, freely rebranched; twigs lax and subpendant, glabrous, the ultimate green portion turning dull brown upon drying, terete. Leaves copious, alternately spreading along the branchlets, glabrous, when dry brown on both sides, chartaceous, horizontal or descending, curvingly folded upon the upper darker green surface, entire or obscurely dentate to crenate toward the sharply pointed acuminate apex, base broadly rounded, the average lamina 13 cm long by 5 cm wide across the middle or below it, narrowly elliptic to ovately elliptic or oblongish; petiole 1.5 cm long or the lower old ones 2 cm in length, smooth, terete, thickened toward the distal end, green but dark reddish brown when dry, persistent; veins 3, arising from the base, pale or yellowish green when fresh, brown when dry, quite prominent beneath, plane above, the middle one extending straight into the apex, the lateral pair terminating above the middle, hairy pockets in their axils at the base, the midvein with 2 to 3 ascending

lateral pairs of nerves from the middle, cross bars and reticulations very faint. Flowers not found. Infrutescence axillary but chiefly from the terminal leaves, 3 to 7 cm long; stalks usually solitary, very sparingly rebranched, yellowish green, more or less zigzag when unbranched, minutely yellowish gray stellate in the early state, ultimately glabrate; fruit pyriform, at least 3 cm long, nearly 2 cm thick above the middle, smooth and hard, shining, flesh red when fully ripe, alternately arranged or only solitary at the base, similar in color and vestiture to the stalks which bear them.

Type specimen number 13996, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in wet sticky soil along wooded banks of streams among the hemp fields at 500 feet above ocean level. The Manobos call it "Carong."

Leaves like those of *Grewia stylocarpa* Warb. but with different fruits.

ULMACEAE

Celtis mindanaensis Elm. n. sp.

An erect tree; trunk 8 m high, 1.5 dm thick, terete, straight, branched above the middle; wood pale or dirty yellowish white, hard, odorless and tasteless; bark smooth, mottled; branches crookedly rebranched, forming a rather dense elongated crown; twigs rigid, also crooked, rather slender, glabrous. Leaves alternately and widely scattering along the branchlets, rigidly chartaceous, descending or subrecurved, nearly flat or concave on the lighter green lower surface, curing nearly equally brown on both sides, entire, subelliptic to ovately oblong, gradually tapering to the sharply acute to acuminate apex, base very broadly obtuse or rounded and occasionally slightly inequilateral, the normal ones 17 cm long, 7 cm wide across the middle or just below it, glabrous, 3-veined from the base; veins prominent beneath, slightly sunken on the upper surface, the midrib with inconspicuous secondary nerves, the lateral 2

veins with secondary ones on the outer side only and whose tips are usually united to form a submarginal line 3 mm from the edge, reticulations few and obscure; petiole smooth and glabrous, 1 cm long, quite broad and caniculate along the upper side; buds elongated, pointed, yellowish gray, sparsely strigose. Flowers not seen. Infrutescence terminal or from the uppermost leaf axils; stalks 1 to 4 cm long, glabrous, bright green, if branched very shortly so; fruits usually few clustered toward the ends, upon 3 to 5 mm long pedicels, yellowish green, ultimately flesh red, barely 1.5 cm long, obovoidly globose especially after being dried, quite pointed toward the base, the circular stigma more or less raised.

Type specimen number 10999, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

Gathered in dry somewhat stony soil of woods skirting the ridge of the Baracatan creek ravine and fronting the upper cogon limits at 1500 feet altitude. "Isog" is the Bagobo vernacular name.

It has a different infrutescence and its leaves are more elongated than in *Celtis philippinensis* *Blco.*

URTICACEAE

***Debregeasia luteocarpa* Elm. n. sp.**

Ascending shrub; stem 1 dm thick, subterete, 5 m high, branched from below the middle; wood wet and very soft, without odor or taste, sappy white throughout; bark dark or dull brown, tough, with lenticels or excrescences, otherwise also sappy white; main branches ascending and spreading, freely rebranched or few branched only, the ultimate ones slender and lax, soft hoary tomentose, the lateral twigs relatively short. Leaves numerous, alternately clustered especially toward the ends of the branchlets, horizontally spreading, the gradually acuminate apex recurved, light green and sparsely strigose above, dull brown when dry and more or less roughened by the raised interstices of the lamina, grayish white beneath even in the dry state, cinereously pubescent, interstices more or less sunken beneath, exceedingly

variable in size, more or less lance shaped or the largest ones elongated to lanceolate, base obtusely rounded and subentire, otherwise with numerous dentately serrate teeth, the average blades 1 dm long by 3 cm wide in the middle region, frequently much smaller, becoming easily detached while drying; midrib hirsute beneath, strigose above; lateral nerves 5 to 7 pairs, the basal pair arising from the base, much ascending, the upper pairs short and more numerous, tips anastomosing, cross bars and cross reticulations very numerous and prominent beneath; petiole 5 to 15 mm long, more yellowish hirsute; bud bracts very caducous, 5 mm long, brown, membranous, deeply concave and almost glabrate on the ventral side, oblongish, terminated by 2 slender teeth. Inflorescence from the upper leaf axils, the fruits laterally clustered below the foliage, 1 cm long, the fruits twice as long in the fruiting state; peduncle solitary or few clustered, gray hirsute, subtended by caducous bracts, bifurcate; main branches shorter, similarly branched, subtended by deciduous rather sharply pointed bracts, ultimate branchlets very short; involucre bracts 1 mm long, oblong, sparsely ciliate, membranous, brown, acute to obtuse at the apex, the inner bracts or bracteoles much smaller; pistils many, minute, pedicel-like, surrounded by twice as long linear more or less hairy perianth segments, subsessile; buds of staminate flowers ovoid or subglobose; perianth less than 1 mm long, 4-segmented, blackish in the dry state, strigulose on the dorsal convex side, oblong, acute at the apex, coriaceous; stamens 4, opposite the segments; filaments 0.3 mm long, smooth, dark brown, compressed, inserted upon the basal portion of the perianth segments; anther subrotund or broadest across the top, 0.3 to 0.5 mm across, light yellow even in the dry state, dorsifixed, laterally dehiscent. Fruiting heads subglobose, less than 5 mm in diameter, sour juicy and berry-like, luteus to aurantiacus in color; mature carpels less than 1 mm long, short clavate, irregular in shape or suboblique, usually upon a short but distinct stout pedicel, stigmatic portion relatively large and quite evident, easily becoming detached from the persistent perianth segments.

Type specimen number 14068, *A. D. E. Elmer*, Cabad-

baran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in black soggy alluvial soil among jungles at the lower end of lake Danao at 4750 feet altitude. "Damay" is the Manobo name.

The luteus to aurantiacus fruits at once distinguish it from the red to crimson fruited *Debregeasia angustifolium* C. B. Rob. an alpine northern Luzon plant. Only one shrub was seen.

***Elatostema agusanense* Elm. n. sp.**

Rather coarse or large tufts; stems several, ascending or the outer ones reclining at the base, varying from 1 to 4 dm long or high, usually curved, curing dull green and striate or longitudinally grooved, slender when compared with their lengths. Leaves chiefly above the middle of the stems which are unbranched, alternate, curing very unequally greenish brown on the 2 sides, much darker green on the upper glabrous side, cystoliths minute, duller or appearing imbedded on the lower surface, glabrous except the nerves beneath, rather abruptly terminated into the acute to acuminate recurved apex, slenderly or more commonly broadly cuneate toward the obliquely acute or usually obtuse base, the scattering basal leaves much reduced, the basal one third entire, inequilateral, otherwise serrately dentate, the lower edge of the broader side much curved, elongated though the widest portion is usually a trifle above the middle, the smallest ones broadly oblanceolate in outline or the shorter obovate in general outline; the average normal leaves 12 cm long by one third as wide just above the middle but frequently smaller especially those on the smaller stems; midrib pronounced beneath and yellowish gray tomentulose, slightly and gradually curved, caniculate along the upper side at the base; lateral nerves 5 to 7, usually the broader side with 1 or 2 more than the upper or narrower side, the basal pair not arising from the same place though both running subparallel with the margins and extending to the middle of the leaf, upper nerves ascendingly curved, their tips coarsely reticulated and united, reticulations along the midrib relatively scarce; the lower

side of the leaf base subauriculate and with 1 to 3 very short extra nerves, all similar in color and vestiture to the comparatively bold midrib; petiole very short yet distinct; stipule deciduous, 1 cm long, 3 cm wide at the base or a little wider, setaceously pointed, pseudostrigose on both sides, dull greenish in the dry state. Flowers in axillary clusters, the 2 sexes upon different plants or at least upon different stems of the same cluster; the staminate clusters larger, whiter and less ciliate hairy than the pistillate clusters; inflorescence in quadrangular clusters, subsessile, diverse in size, the largest ones nearly 2 cm wide across the widest portion, obscurely bilobed; involucre very thick and coriaceous, greenish, glabrous, the segments more or less united into a disk-like receptacle whose margins curve upward and enclose the flowers, slightly roughened on the exterior; flowers grouped in 4's, surrounded by a 6 segmented involucre; bracts averaging 3 mm long, hyaline except the midrib and the apical margin which are greenish colored, about 2 mm wide, a trifle wider across the truncate apex, edges finely ciliate; florets about 6 or only 4 in a group, surrounded by a whorl of 3 segments; bracteoles 2 to 3 mm long, unequal in width, transparent except the greenish midrib which is densely ciliate along the keel toward the obtuse to acute apex; pedicels also transparent, ribbon-like 2 mm long or longer, very short in the bud state; perianth segments 4, united toward the base, 1.5 mm long, ovately elliptic, with acute slightly green colored apices; glabrous filament also short in the young state, slenderly elongated when mature; anther less than 1 mm long, basifixed, apical portion bilobed, inflexed while in bud, sprung back in anthesis. Perianth of the seeded heads greenish, densely ciliate; seeds minute, bony, brown, elongated, very minutely pitted.

Type specimen number 14250, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Gathered in very wet ground of a small open place along a streamlet in a heavy forested ravine at 1500 feet altitude.

Associated and mixed with number 13492 or *Elatostema longifolium* Wedd. Our broader leaves and longer bracts are

distinguishing characters from 456 *Cuming*, a cotype sheet of which is in the Bureau of Science herbarium.

Some of these very closely allied species of *Elatostema* seem to be gregarious for some reason or another. *Elatostema agusanense* Elm. and *Elatostema longifolium* Wedd. were collected under one number in the field, though the dry material could easily be separated into two groups. A similar association is found between *Elatostema umbrinus* Elm. and *Elatostema urdanetense* Elm.

***Elatostema antonii* Elm. n. sp.**

Heavily succulent and few stemmed tufts; stems usually 3 or more from the same root cluster, reclining at the base and spreading, usually sloping downward, subterete, 2.5 cm thick when fresh at the base, soft herbaceous and green, 1 m long or shorter, glabrate, curing yellowish green along the terminal or leaf bearing portion, the internodes deeply channeled along the upper side of the prostrate or inclining stems clear to the leaf bearing tips, the lower side toward the base bearing roots, very seldom rebranched. Leaves alternate, usually several toward the distal end, in 2 lateral rows, flat, chiefly descending, much paler green on the soft pubescent or lanose nether side, glabrous above and distinctly covered with numerous chalky white cystoliths, drying unequally green on the sides, 2 dm long by 7.5 cm wide above the middle, terminated in a linear sharply pointed 1 cm long apex, a trifle inequilateral, basal portion broadly cuneate, subentire toward the base, otherwise serrately toothed, upper edge nearly straight, lower side of the lamina broadest, obovately oblong in general outline; petiole 1.5 to 2 cm long, dirty hirsute along the lower side, broadly caniculate along the upper; midrib nearly straight, green and soft yellowish green hirsute beneath; lateral nerves 7 to 9 on each side, much ascending and usually curved, those along the lower side mainly forked toward their distal ends, cross reticulation obscure although more numerous along the toothed margins; stipule or bud bract caducous, linear to lanceolate, very pale green at least when dry, up to 3 cm long, slenderly pointed or blunter, minutely to-

mentose on the dorsal side. Inflorescence or infrutescence axillary, green, suberect and lying across the upper side of the stem, solitary, the odorless flowers greenish white; peduncle green, fleshy, few mm long, hispidly pubescent; involucre 1 to 1.5 cm wide, composed of 2 alternating pairs of broad lobes, thickly coriaceous, green, slightly hispid on the outside, occasionally more or less united into a fleshy disk; flowers grouped in 4's, staminate, very numerous and dense upon the upper surface of the involucre; involucels hyaline, containing several florets; bracteoles 2 mm long, unequal in width, with a relatively conspicuous midrib especially toward the distal ends, several, obcuneate or obovately oblong, 1.5 mm wide across the broadened apical portion, the keel and around the apex ciliate; pedicels nearly as long as the bracts, subhyaline, somewhat compressed, persistent, glabrous, unequal in length; the 4 involucre bracts subtending the 4 stamens 1 mm long, oblong to ovate, smooth and transparent; filaments short, longer when mature, also transparent; anther less than 1 mm long, inflexed, finally in the reverse position, the cells well separated from the base to the apex and subterete, basifixed; pistillate flowers not observed.

Type specimen number 13894, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered this most characteristic of our Philippine species of *Elatostema* in shallow earth covering huge boulders strewn along the solidly shaded Catangan creek bed at 3000 feet elevation. Named with pleasure after our son *Anton Dambor Elmer*. The Manobo name is "Calangboaw."

This plant is easily cured and its large underneath leaf surfaces are long hairy. The stems lie over the boulders in great confusion, their internodes are most characteristically channeled longitudinally along the upper side, each series of internodal channels alternating with the adjoining ones. Some of these channels extend one half way through the stem and are relatively wide. They serve as water reservoirs during the dry desicating days or periods.

***Elatostema camiguinense* Elm. n. sp.**

Dense masses scattered in clumps; stems exceedingly variable in length, from 3 cm to 5 dm high, angular, at the base reclining, only the larger ones branched from the middle, more or less reclining at the base or creeping and profusely rooted, erect or nearly so, pseudostrigose, green when dry; runners arising from the lower leaf axils or from the root portion of the stem, horizontal, 1 dm long or longer or shorter, very slender. Leaves alternate, chiefly above the middle, paler green beneath both in the fresh and dry state, thinly coriaceous, subsessile, the widely scattering lower ones much reduced, the larger lamina 9 cm long by 2 cm wide across the middle or the widest portion, the narrower ones broadly lanceolate, otherwise elongated, inequilateral and subfalcate, similarly tapering toward both ends, cuneate toward the oblique base, apex slenderly acuminate, the basal one third to one half entire, otherwise coarsely and sharply serrately dentate, glabrous, cystoliths obscure beneath, the leaflets on the runner obliquely obovate and about 5 to 8 mm long, occasionally more elongated; midrib gradually curved, similarly green beneath, not conspicuous; the lower or wider side with 3 to 4 nerves, 1 to 2 nerves less in the upper or narrower side, the basal one extending along the edge and about one half the length of the blade, the upper basal nerve extending along the edge to above the middle of the blades; the balance ascendingly curved from the middle or above the middle, usually forked toward their distal ends and terminating into the teeth, other cross bars and reticulations none; stipular bracts linear and setaceously pointed, pale yellowish green, glabrous, 5 mm long or shorter, subpersistent, pistillate flowers in sessile clusters from the upper leaf axils; staminate ones pedicelled and usually from the lower leaf axils or along the basal portion of the stem or even upon the runners; peduncle varying from 5 to 20 mm long, glabrous, pale green; involucre broadly cup shaped, green, usually composed of 2 unequal pairs of alternating bracts; outer and larger pair connate at the base, 5 mm long, elliptic though apex some-

what constricted, green and with 3 parallel veins, margins only transparent, finely ciliate about the stout usually recurved point; the inner pair of bracts much narrower and a trifle shorter, otherwise similar; staminate flowers severally grouped, subtended by an involucl; bracteoles 4 mm long, 2 mm wide above the middle, the middle region 3-veined and green, the margins hyaline, stout apex constricted and ciliate; main pedicel short at first, becoming few mm in length, subtended by a secondary whorl of involuclal bracteoles; bracteoles averaging 2 mm long, very unequal in width, hyaline except the pale green midrib toward the apex, usually widest above the middle, ciliate along the edges above the middle especially at the apex, obcuneate to linear; pedicel 1 mm long, transparent; perianth 1.25 mm long, very thin, the 4 segments toward the apex sparsely ciliate; filaments very short in the bud state, ultimately elongated; anthers basifixed, cleft from the apex toward the base, 0.75 mm long; pistillate heads flat, sessile, 5 mm wide or less; involucre united into a disk, green, coriaceous, divided and terminated into constricted rather prominent points, pubescent toward the apex; bracts of involucels 1.5 mm long, hyaline, linear, ciliate toward the apex, the inner bracts shorter and very linear; achene pedicel hyaline, 1 mm long, expanded at the distal end; seed smooth, brown, fusiform, 0.5 mm long.

Type specimen number 14227, A. D. E. Elmer, Mambajao, Island of Camiguin, Mindanao, November, 1912.

Densely spreading and matting rock ledges thinly covered with soil along a streamlet of a humid wooded ravine at about 2000 feet above the surrounding sea. The delicate runners with small scattered leaflets is quite a unique character of this species.

To be critically considered and studied in connection with *Elatostema lutescens* C. B. Rob. and *Elatostema viridescens* Elm.

***Elatostema pictum* Elm. n. sp.**

Small clusters or solitary and creeping; stem fleshy, occasionally branched, terete, pale green, varying from a few

cm to 2 dm high or rather long, usually curved, quite slender, glabrous, blackish brown when dry, taking roots from the lower leaf joints. Leaves alternately scattered from below the middle of the stem or frequently from near the base, diverse in size, horizontal and spreading over the rock surface, also succulent, much paler green beneath, very deep green on the upper side except the relatively pale or yellowish green region along the veins or nerves, curing unequally green on the 2 sides, obovate and falcate or very unequally sided, broadly cuneate or obtusely rounded toward the oblique base, broadly rounded at the apex or terminated by a blunt tooth, upper margin straight and entire except a few blunt teeth toward the apex and terminating at the base a few mm above the lower side, the broader or lower side much curved and usually coarsely dentate from the middle to the apex, sessile, 2 to 4 cm long though occasionally only 1 cm long, 1.75 to 2.5 cm wide a trifle above the middle or at the widest portion, the basal ones usually much reduced, cystoliths beneath scattering and obscure, chalky white and raised on the upper side especially crowded along the edges; veins 3, the stoutest or middle one curved and extending into the apex, the lateral pair of veins arising from near the base, the upper one straight and 2 mm below the edge of the lamina, the lower one curved and interarching with the lateral nerves of the mid-vein above the middle and along its lower side; reticulations coarse or merely branched, few, dark brown on the lower side and light green on the upper side in the dry state; stipule oblong, subhyaline, glabrous, 1 cm long or less, deciduous. Male flowers pale green and upon similarly colored slender stalks; female flowers in smaller sessile axillary clusters which have a hoary appearance; peduncle 1.5 cm long, glabrous, green and purplish streaked; involucre 7 mm long, the 4 or more segments forming a broad cup; bracts erect, broadly ovate or elliptic, 4 mm wide, hyaline except the midrib and the basal region which is green and purplish spotted, the broad marginal sides clearly transparent except the midrib which is usually purplish marked, very unequal in size, 4 or more, 3 mm long for the average ones to 2 mm wide, oblong, broad at the apex, free;

pedicels less in length, hyaline; the 4 stamens 1.5 cm long, ovate, with rather acute points, transparent, occasionally bearing a spicule or more toward the apex on the dorsal side; anther 1 mm long, divided from the base to the apex, introrse before and retrorse after anthesis, basifixed; involucre of pistillate flowers flattened, the segments united at the base; outer pair of segments 3 mm long, ovate, long pointed, green at the base, otherwise purplish streaked, pubescent on the back and ciliate along the margins; involucels numerous; bracteoles 1.5 mm long, linear, free, with rounded apices, transparent, conspicuously ciliate; pistil small, exceeded by the bracts of the involucels, short stipitate; ovary glabrous, fusiform in outline, terminated by a small brush of stigmas.

Type specimen number 13484, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Matting rock surfaces or creeping along the bottom of cliffs or around the lower border of huge boulders on the west nearly precipitous summit of Duros peak at 4000 feet elevation. "Yogayod" in the Manobo dialect.

***Elatostema gitingense* Elm. n. sp.**

Small clusters; stems decumbent at the base, terete, succulent, dull brown or greenish toward the top, 8 to 16 cm long or shorter and occasionally longer, usually unbranched, taking root along the lower side or that portion lying upon the ground, the longer ones usually curved, ultimately suberect, the younger portion sordidly appressed strigose. Leaves alternately scattered above the middle, subsessile or very shortly petioled, a trifle inequilateral, the upper narrower side nearly straight, terminated at the base 1 mm above the lower side, oblong, the scattering basal ones smaller, minutely serrately dentate toward the obtusely rounded apex, base oblique and also obtusely rounded, entire below the middle or the basal two thirds of the leaf, the average ones 3 cm long and one third as wide across the middle or the widest portion, glabrous except the midrib and nerves beneath, curing dull green on both sides, deeper green on the upper side when fresh and very

distinctly marked with cystoliths, horizontally spreading or descending; midrib prominent beneath especially toward the base, gradually curved, dirty strigose beneath; basal pair of lateral nerves parallel with the edge and extending to about the middle of the length of the blade, obscure; the 2 to 3 extra pairs of lateral nerves from above the middle of the lamina, ascendingly curved from the midrib, very obscure, reticulations none; stipular bracts caducous, linear, about 5 mm long, pseudostrigose. Inflorescence grayish green, odorless; heads pistillate only, chiefly from the upper leaf axils, sessile, flattened, 5 mm across or smaller; outer pair of involucre bracts unequal in size, 2 to 3 mm long, 1.25 to 1.75 mm wide, membranous, united at the base, ovate to elliptic, apex acute, few nerved, green especially toward the rather thick point, pubescent on the outside; inner pair alternating with the outer pair, narrowly oblong, the middle region toward the apex green, hyaline margins densely ciliate; bracts around the inner region of the involucre 2 mm long, broadly lanceolate, greenish especially toward the acute apex, also densely hairy along the edges; flowers promiscuously spreading; bracteoles linear, varying from 0.5 to 1.25 mm in length, greenish toward the blunt apex, hyaline and smooth toward the base, more than the upper one half long ciliate; pedicel of ovary very short, greenish tinged, glabrous; ovary scarcely longer, fusiform, only as thick as the pedicel but deeper brown in color, at the apex provided with hyaline widely spreading hair-like stigmas.

Type specimen number 12421, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Island of Sibuyan, May, 1910.

Collected in red soil packed in between rocks upon a seepage precipice along the Pauala river at 1750 feet altitude. Its local Visayan name is "Ulmian."

This number was distributed under *Elatostema sessile* Forst. but the late *Dr. C. B. Robinson* after studying the group in European herbaria informed me that it is a new species. The type specimen is in the Royal Botanic Garden of Edinburgh.

Elatostema surigaoense Elm. n. sp.

Perennial herbs; stems few from the same root, 2 cm thick, easily breaking, terete, dull green, 2 m high, branched from below the middle; main branches widely spreading or strongly bent, crookedly recurved, the ultimate ones suberect, quite freely rebranched, glabrate, curing blackish, the twigs when dry striate. Leaves descending, subcoriaceous, duller above, flat, terminated by a sharply pointed acuminate to caudate recurved apex, a trifle inequilateral, base obliquely broad cuneate or obtusely rounded, subsessile, very variable in size, entire below the middle, otherwise coarsely dentate to the apical point especially along the lower edge of the broader side, elongated or the smallest blades broadly lanceolate or nearly so, always broadest across the middle, the upper surface sprinkled with numerous minute cystoliths, also glabrous beneath except the few small strigose hairs along the midrib and nerves or even along the reticulations, the average ones 12 cm long by one fourth as wide at the middle, the young dark purplish tinged beneath when dry, otherwise curing ater on both sides; bud bracts linear and setaceously pointed, involute, 4 to 6 mm long, covered with grayish appressed hairs; midrib conspicuous beneath, also evident from the upper side, yellowish strigose and black when dry on the nether side; nerves along the lower side 5 to 7, the basal one arising from near the base and running 3 mm from the edge of the leaf, connecting with the first or middle ones, the upper ones merely ascendingly curved, their tips coarsely anastomosing and terminating in the teeth; the lower nerves of the upper or narrower side arising 1 cm from the base, similarly extending along the edge of the leaf though longer than its corresponding lower nerve, also coarsely anastomosing with the 3 to 5 nerves above the middle of the lamina, cross bars and reticulations numerous and quite evident from beneath. Florets numerous, the sessile clusters lateral or axillary, odorless, whitish when in anthesis; involucre disk-like, obscurely lobed, 1 cm across, subcoriaceous, glabrous, brown in the dry state, the lobes broadly elliptic; staminate flowers apparently in scattered groups surrounded by an involucre;

involucral bracts 2 mm long, several, hyaline and more or less united at the base, midnerve green and keeled toward the obtuse ciliate apex, obovate to obcuneately oblong, sides ventrally folded; the inner segments spathulately linear, shorter; pedicel hyaline, ultimately 2 mm long; perianth 4-segmented, 1.25 mm long, oblong, contiguous below the middle, terminated into a point, greenish toward the apex and ciliate along the edges; filaments 4, short when young and inwardly bent, slenderly elongated when old; anther 0.75 mm long, basifixed, lobed toward the apex, introrse in the bud state, exerted and reversed when in anthesis; pistillate flowers not seen.

Type specimen number 13637, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Gathered in stony ground of a deeply shaded sag at the base of the nearly precipitous incline of Cawilanan peak at 3500 feet altitude. The Manobo name is "Teoy."

This plant is quite distinct from my number 10514 collected in the mount Apo region and determined as *Elatostema integrifolia* (Don) Wedd.

***Elatostema umbrinus* Elm. n. sp.**

Small tufts and forming scattering masses; stems 1.5 to 2 cm high, very flexible and herbaceous, reclining and taking root toward the base, dull green, dull brown when dry, seldom branched, glabrate, obscurely angular, the upper portion ascendingly curved or suberect. Leaves coriaceous, flat, quite numerous but only above the middle of the stem, when fresh velvety dark green above and much lighter green beneath, curing very unequally green on the 2 sides, in alternating rows, mainly horizontal, sessile, glabrous except the midrib and larger lateral nerves, the upper side covered with raised grayish white cystoliths which are more obscure from beneath, linear in general shape though the larger ones are distinctly broadened at the base and usually with an obscure lobe on the lower side which is either rounded or terminated into a tooth, 4 to 6 cm long, 7 to 10 mm wide toward the base or widest portion, oblique at the in-

equilateral base, gradually tapering toward the apex, entire around the base, otherwise subentire or obscurely serrately dentate especially along the lower side; midrib beneath umber brown and with similarly colored strigose hairs, above plane and covered with cystoliths; lateral nerves in the larger blades 9 to 13 pairs, the upper pairs faint, divaricate except the basal ascending pair, appearing short forked at their distal end, similar in color and much less strigose than the midrib, cross bars or reticulations none; stipule subhyaline, very membranous, glabrous, deciduous, 5 to 8 mm long, oblongish, apex slenderly or abruptly short pointed, very pale green in the natural state. Peduncle of staminate flowers 2 cm long, very slender, green, glabrous; involucral bracts 4, forming a broad quadrangular cup 7 mm long, nearly 5 mm wide, united below the middle, the basal middle portion green and with cystoliths, margins and irregular truncate apex hyaline, keeled on the back above the middle; flowers several to numerous, the mature ones slenderly pedicelled, the buds subsessile, all intermixed; pedicel hyaline, 3 to 4 mm long, subtended by an involucl; bracteoles very thin and transparent, 2, subequal, 5 mm long or less, 1.5 to 2 mm wide, oblongish or broadly lanceolate; perianth segments 4, also hyaline, 2.5 mm long, ovately oblong, with a greenish midrib toward the apex; stamens 4, apparently alternating with the perianth segments; filaments transparent, flattened, as long as the segments, with a strong inward bend from above the middle; anthers pale white, nearly 2 mm long, well divided from the base to the apex, inflexed in the bud state, brown back in anthesis and in the mature state recurved, easily detached, the individual cells subterete and oblong; female flowers not seen.

Type specimen number 13831, A. D. E. Elmer, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in wet deeply humus covered soil of dense forests in the vicinity of lake Danao at 5000 feet elevation. According to the Manobos its vernacular name is "Namancoyong."

This plant is a distinct species though it may be hard to differentiate it from *Elatostema variabile* C. B.

Rob. Its staminate bracts are not corniculate. Leaves thicker in texture, midrib and nerves beneath more conspicuous and distinctly umbrinus in color, shorter and relatively narrower, with cystoliths more prominent on the upper surface and whose stipules are twice as long as in *Dr. Robinson's* species.

***Elatostema urdanetense* Elm. n. sp.**

Small scattered terrestrial tufts; stems 1.5 to 2 cm long, rather slender, usually only a few from the same root cluster, reclining at the base and bearing fibrous roots along the under side, dirty strigose toward the top, rather slender, very seldom branched, leaf bearing from above the middle toward the upper end. Leaves alternating, ascending or horizontal, the terminal ones largest, flat, coriaceous, glabrate on both sides, cystoliths more pronounced and whiter on the upper surface, very dark green above and very light green beneath even in the dry state, oblongish to obovate or subcuneately oblong, inequilateral, straight along the upper edge of the narrower side, broadly cuneate toward the obliquely obtuse base, 3.25 to 4 cm long, 1.5 cm wide across the middle or just above this, apex bluntly acute or merely toothed, entire except the crenately toothed edge from the middle to the apex or the wider lower side and only 2-toothed along the upper edge toward the apex, sessile, the basal leaves frequently much reduced; the midrib umber brown and occasionally strigose beneath in the dry state, extending nearly straight into the apex; the basal lateral pair of nerves arising from near the base but not opposite, extending along the margin a few mm below the edge of the lamina, their tips coarsely anastomosing with the 1 to 3 pairs of secondary nerves arising from the midrib above the middle, other reticulations very few, all similar in color and vestiture to the more prominent midrib; stipule subhyaline, oblongish, about 5 mm long, early or easily falling. Inflorescence upon ascending slender stalks, odorless, greenish except the watery white flowers, solitary in the upper leaf axils; pistillate not seen; peduncle 3 cm long, greenish and with mi-

nute purple spots or streaks, glabrous; head 1 cm across, broadly cup shaped; involucre of 2 pairs of very unequal oppositely arranged bracts, the outer bracts broadly ovate, 5 mm long, glabrous, united toward the base, minutely purplish spotted except the transparent margins, the green keel on the back rather conspicuous; the alternating pair of involucre bracts much narrower and more hyaline; staminate florets grouped in 4's, surrounded by involucels; bracteoles 4 mm long, obovately oblong, greatly varying in width, very thin and transparent except the evident mid-vein, truncately rounded at the apex; pedicels 3 mm long, transparent and ribbon-like, subtended by a whorl of thin hyaline secondary bracteoles which are a trifle shorter and relatively narrower than the primary involucre bracts; perianth 2 mm long, transparent, 4-segmented, the segments ovate to elliptic, with acute apices bearing a single spicule on the back; filament 1.5 mm long, short in the young state; anther 1 mm long, basifixed, divided toward the apex, the bud position becoming reversed in the process of anthesis.

Type specimen number 14249, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Associated and mixed with the preceding species or number 13831, collected in the wet ground of darkly shaded forests in the lake Danao basin at 5000 feet altitude. Leaves thicker, their nerves beneath distinctly umbrinus and only one half as large as in *Elatostema carinoi* Shaw, the type of which has much shorter staminate peduncles.

***Elatostematoides subluxum* Elm. n. sp.**

Large suffrutescent tussocks; stems several, ascending from the base but the upper portion strongly recurved, 2.5 cm thick, terete, branched from near the base, 2 to 3 m high; bark dull green, smooth; wood dingy white, odorless and tasteless, with a large hollow pith; branches laxly re-branched and forming interlaced masses; twigs usually curved upwards, subterete and obscurely fluted, usually curved or twisted, glabrate when old, the younger ones puberulent

and young tips strigose, curing dull blackish brown. Leaves alternately scattered along the numerous branchlets, descending, flat or shallowly curved upon the upper much deeper green surface, marked with cystoliths on the upper otherwise glabrous side, beneath puberulent or strigose along the midrib and nerves, grayish brown beneath and blackish brown on the upper surface when dry, the older ones subchartaceous while the younger blades are submembranous in texture, the larger ones 15 cm long by one third as wide, the smallest one is barely more than one third as large, gradually tapering toward the acute to acuminate recurved apex, the suboblique base obtuse to rounded, inequilateral especially below the middle, broadly lanceolate to subelliptic, entire at the base, otherwise crenate; veins 5 at about one third from the base, 3 arising from near the base but distinctly alternating, the middle or larger one branched 1 to 2 cm above the base, the upper branch straight and extending clear into the apex, the lower one from the middle or below it, yellowish gray strigose especially toward the base; cross bars and reticulations also prominent from beneath and raised, the outer cross or secondary branches interarching; petiole only about 3 mm long or subsessile, subolivaceous strigose; bud bract and stipule 7.5 mm long, caducous, slenderly pointed from near the base, glabrous and brown on the ventral and cinereous on the opposite side. Inflorescence sappy white, axillary or lateral, quite easily breaking, in the early state subtended by similar bracts upon subsessile or short stalked glomerules of diverse sizes; peduncle 3 mm long, almost 1 mm thick, green when fresh, puberulent, rigid; involucre apparently a small disk, coriaceous, 4 mm across, terminated into a few blunt points or teeth, minutely ciliate especially along the margins toward the apex, brown in the dry state though appearing transparently punctate; stamens promiscuously scattered, bud ovoid or subglobose and more or less ciliate; bracts of involucels very unequal in size, the longer ones 1.5 mm in length, conduplicate, oblong, few to several in a whorl, obscurely united at the base, obtuse, the smaller ones mere vestiges, sparsely ciliate; pedicel 2 mm long, flattened brown as its subtending bracts, ciliate along the edges;

perianth segments 5, united at the base and ultimately widely spreading; lobes oblong, obtusely rounded at the apex, membranous, brownish, persistent, ciliate on the dorsal side toward the apex and down along the edges; stamens as many, opposite the segments and inserted upon them at about the middle; filaments reddish brown, the basal one half adnate to the perianth segments, glabrous, the free portion 1.25 mm long and exerted; anthers also reddish brown especially the dark colored connective, almost 1 mm long, fully as wide across the base, ovoid, basifixed, laterally dehiscent, exteriorly curved, the emptied cells very widely spreading.

Type specimen number 13493, A. D. E. Elmer, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Collected in loose very moist and more or less gravelly soil along streamlets of densely wooded ravines at about 3500 feet altitude. The Manobo vernacular name is "Catco."

Distinguished from *Elatostematoides laxum* (Elm.) C. B. Rob. by the pilose ends of the twigs, leaves with pilose nerves and more numerous veins which are differently arranged and with entire to crenate not dentate margins.

Laportea agusanensis Elm. n. sp.

Shrub-like tree; stem 15 cm thick at least, suberect, terete, 5 to 8 m high, branched from near the middle; wood very soft and pulpy, quite odorless and tasteless, yellowish tinged; bark smooth, yellowish brown and gray mottled, the inner portion wood color; branches divaricate, freely rebranched; the twigs slender, ascendingly curved toward their ends, glabrous. Leaves sublucid, horizontal, slightly recurved, diverse in size, the young ones very pale or light green, subcoriaceous, alternate, drying greenish on both sides, glabrous, apex rather abruptly acute or acuminate, base obtusely rounded or rounded, elliptically elongated, the larger lamina 4 dm long and 1.5 dm wide across the middle, the smallest lamina 12 cm long by 4 cm wide, entire; midrib broad beneath and curing darker brown, frequently purplish tinged, slightly raised along the upper side, glabrous; lateral nerves 7 to 9 alternating pairs,

ascendingly curved from the midrib, relatively conspicuous, similar in color fresh or dry, cross and coarse reticulations faint; petiole varying 2 to 14 cm long, more or less grouped along the upper side, glabrous, pale green though brownish black when dry, glabrate or brown pulverulent, usually a trifle expanded at the base; bud bract erect or nearly so, much paler green beneath, glabrate, acuminate pointed, 7.5 mm long, involute. Inflorescence or infrutescence horizontally spreading, paniculate or subcorymbose, arising laterally in between the leaves or subaxillary, characteristically spreading over the twigs and foliage, not pendant, 1 to 2 dm long or wide; peduncle one fourth as long, usually solitary, glabrous, dull brown when dry; branches alternating, comparatively short, divaricate, similar in color when dry, green or lividus tinged in the fresh state, the lower or longer branches usually with a very short secondary branch arising from the same more or less thickened and expanded portion of the main stalk; larger branches similarly rebranched from the middle, the ultimate ones very short; distal ends of the ultimate branchlets of the infrutescence much compressed and expanded, glabrous, usually bearing small clusters of 3 pistillate florets; pedicels 2 mm long, subcompressed, glabrous, at the base subtended by mere bract vestiges, gradually enlarged toward the distal end; ovary solitary, sessile, tilted, subtended by a rim-like disk with 3 short and unequal teeth on the outer side, flattened, ovate from the side view, 1 mm long, extended into a 2.5 mm long slenderly tapering solitary stigma which along its ventral surface is distinctly pulverulent. The subtending involucre of the fruit twice as large, falling with it; carpel solitary, subpendant, dark green, smooth, subcompressed, ovoid, 5 mm less across the base, obtuse at the apex.

Type specimen number 14019, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in wet loose gravelly or stony ground along a streamlet in densely shaded or wooded ravines at 750 feet above ocean level. The Manobos call it "Sagay de Bungabung" or the Sagay along the Bungabung creek.

Later in the season I have seen beautiful tree specimens with profuse fruits in the fertile valley toward Cabadbaran.

Apparently belonging in the group with pedicelled female flowers and fruits.

Pellionia laciniata Elm. n. comb. *Elatostema laciniatum*
Elm. Leaf. Philip. Bot. I, 287, 1908.

Pellionia sordida Elm. n. sp.

Stems forming dense rank masses, 5 to 7 dm long or high, dull green, puberulent especially toward the 1.5 cm thick base, sparingly branched from below the middle, usually reclining toward the more or less curved base, taking roots from the lower joints; branches divaricate, seldom rebranched, rather slender, the apical portion glabrous, obscurely angular or striate, curing nearly black, frequently a little zigzag. Leaves alternately scattered, 1 to 2 cm apart, dark green though lighter beneath, horizontal or descending, glabrous, atter when dry though duller on the upper side which bears minute cystoliths, subsessile or upon very short but distinct petioles, inequilateral especially toward the obtuse base, the upper side narrower and nearly straight, terminated by a slender acuminate point or tail, entire below the middle, that portion between the middle and the apical point coarsely toothed or serrately toothed especially along the lower edge, beneath appearing pulverulent, 12 to 15 cm long by 4 cm wide across the middle or the widest portion, frequently much smaller and even bract-like, fusiformly elongated; midrib nearly straight, plane above, rather conspicuous beneath, of the same color both in the fresh and dry state; lateral nerves about 5 to 7 on each side, the basal pair very faint, the upper ones divaricate and coarsely reticulate, the balance much ascending, with coarse cross bars and reticulations above the middle, usually with secondary intervening nerves extending from the midrib to one half way to the edge of the blade. Inflorescence ascending, axillary, solitary or few clustered; branchlets of the whole inflorescence short, glabrous, angularly compressed, stout, usually upon 1 cm long peduncles;

pistillate flowers clustered upon the somewhat congested ends of the branchlets, subtended by minute bract vestiges or ebracteolate; pedicels 1 to 3 mm long, subterete, glabrous, persistent, stout; florets articulate to the distal end of the pedicel; perianth 5-parted, the segments slenderly laciniate; ovary sessile, ovoidly elongated, terminated by 3 hair-like stigmas; fruiting perianth segments 4 mm long, well united around the base, broadly lanceolate, the apical 2 mm portion seta-like, brown and minutely purple spotted, glabrous, the sides ventrally folded especially toward the apex, rotate-ly spreading with the slender point curved and twisted; staminodes flat, glabrous, opposite the perianth segments and inserted upon their bases, persistent with them, 0.75 mm wide, rounded or truncate at the distal end. Seeds lenticular, dirty brown, becoming easily detached, smooth, 1.33 mm across, sessile.

Type specimen number 14251, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected from large boulders lying in the deeply shaded Catangan creek bed at 2500 feet altitude.

My number 13491 collected in this general region is certainly not the same species, though it is identical with *Pellionia laciniata* Elm. Neither do I think that our new species here proposed is the same as *Pellionia sinuata* (Blm.) Boerl. a very imperfectly known species.

***Procris frutescens nervosa* Elm. n. var.**

Reclining shrub; stem nearly 5 cm thick, terete, 2 to 3 m high or long, crooked, branched from below the middle; wood dark brown, odorless and without taste, rather hard and closely grained, the duller brown pith quite prominent; bark relatively thick, brown, coarsely but deeply checked; branches reclining, freely rebranched, the ultimate ones slender and descending. Leaves heavy and succulent, descending or horizontal, very dark green and glabrous on the upper side, alternately scattered toward the ends of the twigs, much paler beneath and densely covered with minute cystoliths, the midrib nerves and reticulations provided with

deep brown scales or scale-clusters, curing dull brown on both sides, slightly unequal toward the subcuneate base, obovately elongated, 2 dm long by 6 cm wide above the middle, obtusely rounded at the distal end and abruptly pointed, margins apiculate except toward the inequilateral-sided base; midrib raised beneath, scurfy brown; lateral nerves 11 to 15 pairs, also prominent and scurfy beneath, subparallel, the basal ones very oblique, distal ends of the upper ones curved, cross bars and coarse reticulations few and relatively obscure, also scurfy; petiole 1 cm long, prominently caniculate above, scurfy beneath even the young green portion of the branches; stipule caducous, equalling the petiole or less, sparsely sprinkled with scale-like hairs, linearly oblong, after falling leaving prominent oblique excrescences. Staminate inflorescence subpendant, greenish white, solitary from the lower leaf axils, 1 dm long, corymbosely paniculate from the middle, all the branches as well as the peduncle fleshy and latericibus scurfy, nearly black when dry; the short ultimate branchlets subtended by bracts; pistillate flowers in sessile greenish compressed heads from the upper leaf axils; staminate flowers subsessile or upon 0.5 mm long pedicels which are usually subtended by bract vestiges green except the dark brown scales; buds truncately obovoid; perianth tips overlapping the stamens, 5-segmented; segments united at the base, obovately oblong, reddish brown tinged, otherwise hyaline except the midvein, broadly rounded at the apex, gradually narrowing toward the base, the exterior especially the basal portion sprinkled with chocolate brown scales, the sides transparently punctate; stamens as many as segments, opposite them and inserted upon their bases; filaments incurved in the bud state, 2 mm long ultimately, glabrous, flattened, the middle line dark brown, sides hyaline though tinged with a little brown, rugosely folded or glandular along the upper side toward the apex; anther 1 mm long, apex truncate and the slightly emarginate base lobed, ovately oblong, attached a trifle below the middle, the cell walls also reddish brown tinged; pistillate heads flatly globose, sessile or nearly so from the upper leaf axils, 5 to 8 mm across; florets very numerous, dense, usually subtended by 0.75 mm long linear glabrous

dark brown bracteoles; perianth 1 mm long, apparently 5-segmented, the basal one third united about the imbedded portion of the ovary, glabrous, nearly black in the dry state, the segments clavate; ovule sessile, brown, ellipsoid, 0.75 mm long, bearing a tuft of comparatively long brown stigmatic hairs.

Type specimen number 13602, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Discovered this interesting plant upon moss covered boulders on the summit of Duros peak at 4000 feet height. Its Manobo vernacular name is "Marayhay."

Our leaves are larger and more numerously nerved than those of typical *Procris pseudostrigosa* *Elm.* and possibly merits specific rank rather than a variety of *Procris frutescens* *Blm.*

***Procris urdanetensis* *Elm.* n. sp.**

Scandent and subepiphytic shrub; stem very flexible, crooked, 2 cm thick, terete, up to 3 m long, occasionally branched from near the base, usually from below the middle, repeatedly branched toward the top; wood soft, whitish, pith greenish and large, covered with smooth gray or yellowish gray bark; branches spreading or descending, rather long and somewhat drooping, 3 to 5 dm long; the glabrous twig ends green in the natural state, black when dry, appearing obscurely angular. Leaves numerous, alternating, horizontal or the lower ones descending, leathery, flat, the acuminate to caudate apex recurved, lucid and dark green above, much lighter green beneath, variable in size, coarsely and obscurely dentate between the middle and the apex, otherwise entire, glabrous on both sides, after when dry, inequilateral especially toward the obliquely obtuse or obtusely rounded base, the average larger lamina 1 dm long by 3 cm wide across the middle, often much reduced, oblong or the smaller ones broadly lanceolate, with or without cystoliths beneath; petiole 1 cm long, green when fresh, nearly black when dry, glabrous, flattened and shallowly grooved along the upper side; stipule brown, also

glabrous, setaceous lanceolate, 7.5 mm long, very early falling and leaving yellowish gray scars; midrib prominent beneath and covered with plain cystoliths, plane above; lateral nerves 4 to 7 pairs, much ascending and gradually curved from the midrib, tips of the upper nerves connecting, also prominently marked with cystoliths, cross bars or reticulations obsolete. Male inflorescence solitary, hanging from the lower leaf axils or lateral from below the foliage, 1 dm long, branched from above the middle; peduncle slender, blackish brown when dry, glabrous; lower branches usually forked, more or less clustered toward the ultimate ends, in the early state scurfy brown; flowers cremeus, glomerated toward the distal ends; pistillate flowers in dense flattish green subsessile axillary clusters; ultimate pedicel glandularly tubercular; staminate flowers subsessile or upon 0.3 mm long pedicels, the buds compressed globose, 2 mm in diameter; perianth 5-segmented, very thin and subhyaline, strongly arching over the stamens; segments almost 2 mm long, elliptic to obovate, united toward the base, apex rounded, midrib evident especially toward the apex, the outer or exposed ones occasionally with reddish brown glands, otherwise glabrous and not ciliate; stamens of an equal number and opposite the segments; longer filaments 1.5 mm in length, glabrous, dark brown, much flattened, linear, inserted upon the basal portion of the perianth segments, inflexed in the bud state; anther 0.75 mm long, fully as wide across the base, short ovoid, the cells much thicker and obscurely lobed at the base, obtuse at the apex, much lighter in color than the reddish brown connective. Fruiting heads whitish and succulent, the minute brown seeds sunken in upon the outside of the fleshy receptacles, sessile, 5 to 8 mm across, in the axils of the upper leaves, flattish globose; perianth composed of 5 segments; segments nearly free, 1 mm long, broadly clavate, dull greenish or in the dry state appearing nearly black, basal portion subhyaline, the broad or truncate apex usually with a minute point and a few glands; achene brown, fusiform or ellipsoid, 1 mm long, obscurely punctate, sessile, bearing a very short apical point, 0.5 mm thick across the middle.

Type specimen numbers 13792 and 13708, A. D. E.

Elmer, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

The first number was collected in the moss laden woods at 6250 feet altitude of mount Urdaneta and was called by the Monobos "Cawing-cawing." The last number was collected in very wet and stony soil of the dense forests at 5000 feet height in the lake Danao basin and was called "Pering" by the same natives.

***Procris volubilis* Elm. n. sp.**

A low climber along small stems and over rotten stumps; stem the size of an ordinary lead pencil or thicker, flexible, terete though the larger ones are longitudinally fluted, crooked and inclined to twine, rather closely attached to its support, repeatedly branched toward the top; woody tissue white, pith large and greenish, covered with smooth grayish green bark; branchlets much curved, the longer ones drooping and rebranched, the apical portion pale green though nearly black when dry, glabrous, the tips ascendingly curved; roots from the under side of the stems and larger branches. Leaves flat, descending, thinly coriaceous, dark green above and much paler beneath, curing blackish brown on both sides, without cystoliths, glabrous, exceedingly variable in size, alternate, usually slightly inequilateral, the acuminate to caudate apex recurved, tapering toward the obtusely rounded base, elongated and usually widest just above the middle, that portion below the middle entire, otherwise bluntly dentate even along the apical point, the larger ones nearly 2 dm long by 7 cm wide across the widest portion, those on number 13856 considerably smaller; midrib prominent beneath, glabrous, flat above, black beneath when dry; lateral nerves 7 to 10 pairs, ascending, only a trifle curved, more numerous toward the apex, relatively prominent and similar in color, very obscure toward their distal ends, secondary intervening nerves and cross bars faint; petiole 5 mm long or less, glabrate or puberulent along the upper flattened side, ater when dry; stipule caducous, 1 cm long or shorter, membranous, glabrous, brown, folded, linear, setaceously pointed. Inflorescence odorless, scattered along the stem branches and even

in the leaf axils, reddish tinged except the inner floral organs; staminate flowers subglobose and 2.5 mm in diameter, clustered toward the end of the ultimate branchlets, upon 2 to 3 mm long pedicels, becoming easily separated; pedicel glabrous, pale brown when dry, subterete, usually subtended by short acute fleshy bracts; perianth 5-parted, united below the middle, arching over the stamens, ultimately widely spreading; segments 2 mm long, elliptic, very thin and reticulate, obtuse at the apex and usually terminated by a minute point arising just below the edge or the outer bracts rather, prominently pointed; stamens as many, opposite the perianth segments; filaments almost 2 mm long in anthesis, inflexed in the bud state, band-like, hyaline, glabrous; anthers 1.5 mm long, lobed below and attached at the middle, apex notched and not as wide as the base, laterally dehiscent; pistillate flowers not observed.

Type specimen numbers 13856 and 13898, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

The former number was discovered in the very humid steep incline of Cawilanan peak at 4500 feet altitude and was named "Nonay" by the Manobos. The second number cited was collected in wet rocky ground of the wooded bank of the Catangan creek at 3000 feet. It is a much coarser plant though no doubt the same species.

The author is not certain as to the genus.

VERBENACEAE

***Avicennia mindanaense* Elm. n. sp.**

Tree-like shrub; stem 3 to 5 m high, 1 dm thick, freely rebranched, the glabrous ultimate ones numerous and lax, forming dense masses; twigs relatively short, nodulose at the point of branching; bark very smooth, dull ashy gray; wood pale white, heavy, hard, burly, with a turnip-like odor. Leaves easily becoming detached, coriaceous, slightly folded upon the upper surface, ashy green beneath and yellowish gray in the dry state, lucid and dull brown or blackish on the upper side when dry, opposite, rather

numerous, the entire margins subinvolute at least when dry, gradually tapering to the sharp acuminate point, base obtuse or subcuneate, quite variable in size, broadly lanceolate to ovately lanceolate or occasionally elliptic oblong, the average blades 7.5 cm long by 2.5 cm wide across the middle or a trifle below it, frequently larger and occasionally smaller; midvein flattened but more conspicuous beneath; the lateral nerves and reticulations more evident on the upper side; petiole 1 cm long or longer, compressed, thick, glabrous. Inflorescence terminal, few and oppositely branched or occasionally verticillate, all the stalks grayish green, obscurely angular, thick and rigid, the young portion very finely puberulent; flowers sessile clustered toward the ends of the ultimate branchlets, with a distinct orange odor; calyx subpersistent, erect, strongly imbricate, nearly free, canescent on the outer exposed sides, densely ciliate along the margins, deeply concave on the glabrate ventral side, ovately oblong or merely oblong, bluntly obtuse at the apex, 4.5 mm long, one half of that in width, the basal ones much shorter, yellowish green; corolla deep golden yellow, the constricted basal portion falsely united, glabrous, rigid, erect except the ultimate recurved lobes, fleshy, 4-5 mm long, 2.25 mm across the middle of the 4 subelliptic lobes; stamens also 4, alternating with the corolla lobes and inserted near the throat; anthers broadly oblong, 1 mm long, emarginate at the apex, bilobed at the base, dorsifixed; filament glabrous, 0.5 mm long, much tapering from the base to the apex; pistil 3 mm long, terete, much elongated, the basal one third glabrous, the middle one third densely cinereous, the apical one third glabrous and bluntly 2-pointed; fruits likewise green when fresh, turning yellowish gray when dry, ovoid and somewhat flattened, 2 cm long, nearly 1 cm thick at the base, containing a pair of thick greenish cotyledons.

Type specimen number 11990, A. D. E. Elmer, Davao, District of Davao, Mindanao, October, 1909.

In saline soil or in shallow brackish water along the coast in the town of Davao. "Mabaran" is the native name.

This number was distributed as *Avicennia alba* Blm. but its fruit is distinct from number 400 of Mr. Bolster's collection from the Surigao coast and which I take to be *Blume's* species.

***Callicarpa attenuifolia* Elm. n. sp.**

Very lax shrub; stem solitary or few clustered, terete, suberect or spreading, branched from near the base; wood very soft, greenish white, odorless and tasteless, with a large white pith; old bark greenish, sparingly brown lenticelled; branches horizontally spreading, terete, green, avellaneus scurfy at least in the dry state, very slender and occasionally drooping. Leaves well scattered oppositely, descending, membranous, the gradually tapering acuminate or more commonly caudate tips recurved, only shallowly folded on the upper darker green side, slenderly attenuate toward the base, elongated or nearly fusiform in outline, when dry brown above and yellowish green beneath, both sides with glistening yellow minute glands, only the midvein, nerves and cross bars on both sides grayish pulverulent, the average or larger ones 2 dm long by 4 cm wide across the middle, entire toward the base and toward the apical point or tail, otherwise finally and rather sharply dentate; petiole 1 to 2 cm long, avellaneus scurfy or pulverulent, striate and fluted along the upper side, ascendingly curved from the base; midrib prominent beneath toward the base, grooved along the upper side, similarly scurfy or pulverulent; lateral pairs 9 to 12, much ascending and a trifle curved, also prominent beneath and similar in pulverulence, crowded toward the apex, very short at the base, tips anastomosing, reticulations quite evident and oblique or nearly so beneath. Inflorescence erect or divaricate, axillary but chiefly toward the top, bifurcate from below the base, 2 to 3 cm across; main stalks or peduncles proper 1 cm long at most, avellaneus scurfy, repeatedly forked at regular intervals, all the branches similar in vestiture and subtended by setaceous bracteoles, the ultimate ones bearing toward their distal ends small clusters of odorless flowers; buds truncately obovoid, their pedicels very short and becoming easily detached, thereby leaving conspicuous scars, subtended by 0.5 mm long linear bracts; calyx cup shaped, 1.25 mm long, 1 mm thick across the truncate or minutely apiculate apex, rather con-

spicuously 4-veined, with minute light yellow glands, its pedicel when in flower scarcely longer but densely covered with glands; corolla at most 1.5 mm long, turbinate, 1.25 mm wide across the top, glabrate or puberulent especially along the midveins, membranous, easily separating at the base, bluntly 4-toothed at the apex; stamens 4, alternating with the segments and inserted a trifle below the throat; filaments 1 mm long, thread-like, glabrous; anthers 0.75 mm long, 0.5 mm wide, basifixed, notched at the apex, lobulate at the base, flattened, dehiscent along the edges; ovary globose, 0.5 mm in diameter, densely covered with glands; neck 3 mm long, filiform, glabrous; stigma prominently expanded. Fruits globose, almost 2 mm in diameter, the basal one half tightly surrounded by the calyx, sprinkled with light yellow glands; seeds apparently only 2 or at most 4, compressed, 1.5 mm long.

Type specimen number 13536, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Gathered in a small open glen of rich soil among the woods along Giwantanan knoll at 2000 feet elevation. "Simadgimbajon" is the stifling Manobo name.

***Callicarpa epiphytica* Elm. n. sp.**

Large epiphytic shrub; main stem 5 to 8 cm thick, ascending, 5 m long or high, crookedly rebranched; wood rather hard, whitish, a trifle sweet, odorless; bark gray, minutely checked and scaling, testaceous except the epidermis; branchlets ascending or horizontal, yellowish brown scurfy, subterete. Leaves opposite, copious, subcoriaceous, horizontal or descending, flat or only the slenderly and sharply acuminate apex recurved, the upper or smaller ones obtuse or occasionally obliquely obtuse at the base, the larger or lower leaves broadly rounded at the base, dull green when fresh and glabrous except the mid-nerve, when dry brown on this same upper side, beneath beautifully ochraceous scurfy or stellately puberulent in the fresh as well as in the dry state, the smaller ones broadly lanceolate, the larger ones ovately elongated, entire, the

larger lamina 13 cm long and nearly 5 cm wide toward the base, the upper or smaller lamina less than one half as large; longer petioles 2.5 cm long, striate or angular, fluted along the upper side, densely ferrugineous scurfy or coarsely pulverulent; midrib similarly scurfy or puberulent on both sides, sunken along the upper side and prominently raised along the lower side; lateral nerves of the larger leaves 5 to 7, ascendingly curved, relatively prominent and yellow beneath, tips barely united, cross bars and reticulations quite evident from beneath. Inflorescence terminal and from the upper leaf axils; peduncle usually solitary, ascending, 5 cm long or shorter, similarly pulverulent, somewhat curved, with the forked branches 1 dm long or shorter; branches from above the middle, similarly forked toward their distal ends, subtended by 5 to 20 mm long linear or setaceous ochroleucus pulverulent ascendingly curved and subpersistent bracts; ultimate branches subtended by bract-eoles, bearing a small cluster of flowers toward the distal ends; pedicels varying from 1 to 2 mm long, one half as thick, terete, densely covered by short stellate hairs; buds in the very young state globose, becoming elongated; calyx cup shaped, 3 mm deep and as wide across the 6-apiculate top, leathery, covered with a stellate puberulence and intermixed with some light yellow; corolla submembranous, 7 mm long, gradually expanded from the base toward the 6-segmented top, the calyx surrounded portion glabrous, otherwise the outer surface densely covered with light yellow glands and with a stellate puberulence; lobes imbricate in the bud state, oblong, obtuse at the apex, glabrous on the inner sides; stamens 6, included, alternating with the segments; filaments slender, 2.5 mm long, glabrous, inserted upon the basal portion of the corolla, compressed and slightly wider at the base; anthers equalling the filaments, oblong, 1 mm wide, apex truncately rounded and obscurely emarginate, basifixed and bilobed at the base, dehiscing along the edges, the connective on both sides strewn with light or pale yellow glands; ovary 1 mm wide across the flattish gland covered top; style terete, fleshy, 4 mm long, curved and twisted toward the base; stigma capitate, subglobose, pulverulent. Fruits globose, 4 mm in diameter, three

fourths surrounded by the calyx, the apical or exposed portion apparently glandular.

Type specimen number 13822, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered this epiphytic shrub upon the lower large limbs of moss covered lofty trees in the very humid forested basin just above lake Danao at 5250 feet altitude. "Madolau" is its Manobo name.

Number 13861 was collected in stony ground along the ridge between Duros and Cawilanan peaks at 3500 feet elevation. It was a small slender erect tree and not at all epiphytic, otherwise the two numbers represent the same species.

Closely allied to *Callicarpa flavida* Elm. but leaves always broadest below the middle or toward the base and with other minor characters.

***Vitex curtifrutescens* Elm. n. sp.**

A stocky tree; trunk 6 dm thick, 12 m high, branched from below the middle, forming a dense elongated brown; main branches widely spreading, rebranched all along, the ultimate ones yellowish gray and from 1 to 2 cm thick; bark gray with brown blotches, rather finely checked; sapwood white but very thin, the balance brownish, brittle, very hard and heavy, closely grained. Leaves widely spreading, diverse in size, nearly flat, descending, the entire margins more or less wavy, the abruptly acute to acuminate apex recurved or only obtusely rounded, base broadly cuneate or obtuse, obovate to obovately oblong, glabrous, drying blackish brown, the more exposed leaves strongly conduplicate on the upper darker green side, lamina 2.5 cm wide above the middle, the larger ones measure 6 dm long, alternately crowded toward the ends of the twigs; midvein raised beneath, plane on the upper side, yellowish green, glabrous; lateral nerves 7 to 11 but usually 9 pairs, very oblique, similar in color and prominence, usually branched along the lower side from above the middle toward their ends, ending in coarse reticulations, the cross bars few and also conspicuous, reticulations relatively fine

and equally visible from both sides; petiole subterete, ascending, glabrous, yellowish green in the fresh state, somewhat swollen at the basal point of the blade, from 5 to 10 cm long. Infrutescence erect or at least ascending, 7 to 13 cm long, strict; stalks rigid, glabrous, thick, yellowish gray, usually solitary from the leaf axils; fruit upon stout 5 mm long pedicels or subsessile, hard, smooth, similar in color, 2 cm across, normally somewhat compressed, 2-seeded.

Type specimen number 10994, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

Discovered in dry fertile soil along the wooded edge of the Baracatan creek at 1500 feet altitude or at the upper limit of the cogon field. The Bagobo name is "Magamabut."

***Vitex premnoides* Elm. n. sp.**

Quite a large tree; trunk 17 m high, mostly branched toward the top; wood soft, yellowish especially toward the center, odorless and tasteless; bark thick, smoothish, brown, yellow beneath the epidermis; main branches spreading but not very long, quite often rebranched; twigs horizontally spreading, green and puberulent on the young tips, the ultimate ones ascendingly curved. Leaves along the twigs only, opposite, deeply folded upon the upper deep green and lucid surface which in the dry leaves is atter, exceedingly variable in size, apex abruptly acute and strongly recurved, base obtusely rounded, oblong or subelliptic, the larger blades 7.5 cm long by 3.5 cm wide, edges entire, much lighter green beneath when fresh and dull grayish brown when dry, glabrous above, nearly so beneath; petiole 1 cm long, finely canescent when young, glabrate when old, caniculate, usually with interaxillary buds, leaving large gray scars after falling; midrib prominent beneath, sunken above, in the young state appressed puberulent; lateral nerves 5 to 7 pairs, ascending and curved, relatively conspicuous beneath, cross bars very faint, reticulations exceedingly minute. Paniculate inflorescence terminal, erect or suberect, 5 to 8 cm long and fully as wide, branched from

below the middle, usually with only a single stalk or peduncle and subtended by a pair of small leaves; branches opposite, widely spreading, subtended by sharply acuminate appressed yellowish pubescent bracts, rebranched from above the middle, similarly appressed pubescent, ultimate branches nearly at right angles and at their distal ends bearing a small cluster of flowers; pedicels 1 to 3 mm long or longer, olivaceous pubescent, subtended by bracteoles; calyx turbinate, dark green, 2.5 mm long, obscurely 4-angular, concrete except the spreading 4 short teeth, glabrate or yellowish gray puberulent, at the base subtended by a pair of short but sharply pointed persistent bracts; corolla bud globose, yellowish; segments 4, yellowish, alternating with the calyx teeth, valvate in the bud state, ultimately becoming reflexed and early falling, subequal, triangular in shape, the larger ones 2.5 mm long and 2 mm wide across the base, glabrate or nearly so, acute at the apex or subrounded; stamens also 4, alternating with the petals and occasionally inserted upon their bases; filaments whitish, 2 mm long at least, glabrous, compressed toward the base, pointed toward the apex; anther yellow, 1 mm long, rotund, almost as wide, truncately rounded at the basifixed base, laterally dehiscent; ovary crown light yellow, thick and fleshy, glabrous, conspicuously rugose; style central, erect, thick, likewise glabrous, ridged longitudinally, apex irregularly truncate.

Type specimen number 11644, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Discovered in moist fertile ground of dense woods at 4000 feet altitude and along the northern bank of the Baring river. The Bagobo name is "Lamog."

Possibly it should be referred under *Premna* rather than under *Vitex* and to be compared with species belonging to the *Premna nauseosa* Blco. group.

VIOLACEAE

Alsodeia dubia Elm. n. sp.

A rather large tree; trunk 8 dm in diameter, 17 or more m high, terete, straight, with branches arising from

the middle; wood odorless, slightly bitter or without taste, moderately hard or soft, the thin sapwood white, the heartwood reddish tinged; bark thick, smooth, brown on the trunk, gray on the branches, otherwise castaneus; main branches few and widely spreading; twigs not numerous, very slender and lax, horizontal and descending, appearing a trifle zigzag, puberulent, yellowish brown when dry. Leaves coriaceous, similarly spreading, in alternating distichous rows, copious, the very abruptly acute apex recurved, broadly obtuse or rounded at the base, oblong or subelliptic, quite variable in size, entire, fuliginous in color on both sides when dry, the larger ones 12 cm long by 4.5 cm wide at the base, the smaller ones one half as large, glabrous, much deeper green above; midrib prominent beneath, also slightly raised on the upper side toward the base, very deep reddish brown on the dry specimens, in the young state puberulent, ultimately glabrate except along the sides; lateral nerves 5 to 7 pairs, much ascending though only slightly curved, comparatively prominent, cross reticulations obscure; petiole 5 to 8 mm long, thick, caniculate, bark covered, glabrate when old. Flowers ascending, odorless, usually in dense clusters of the leaves; pedicels none or short and very thick; calyx 5 mm long, short yellowish green pubescent or puberulent on the outside only, more or less united at the base, angularly rugose; segments 5, oblong, averaging 2 mm wide, imbricate in the bud, rigidly coriaceous, the margins much thinner, the median portion of the inner segments almost ridged along the back, rounded at the apex, elliptic or merely oblong, slightly unequal in width; petals 4.5 mm long, oblong, narrowed at the base, rounded at the apex and occasionally minutely notched, 1.5 mm wide, merely pubescent on the back, densely villous on the whole inner surface, frequently becoming twisted, coriaceous, deciduous; ovary surrounded by the densely pubescent stamineal tube which is nearly 3 mm long and distinctly stipitate at the base; stamens about 8, inserted upon the truncate apical portion of the ovary with the stamineal tube; filaments 1 mm in length, long pubescent; anther 1 mm long, 0.75 mm wide, oblong, basifixed, base truncately rounded, apex minutely mucronate; stigmas composed of several linear more

or less pubescent segments; staminal tube at the base surrounded by 5 hard glabrous wedge shaped 1 mm long dark red or brownish glands.

Type specimen number 13956, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected this big tree in the forested saddle between Duros and Cawilanan peaks at 3500 feet altitude. Its Manobo vernacular name is "Badabogon."

Rather uncertain as to the right family and may possibly belong to *Flacourtiaceae* or rather to *Icacinaceae*.

***Rinorea fasciculata minor* Elm. n. var.**

Small or medium sized tree; stem 2 dm thick, 10 m high, branched toward the top and forming on elongated dense crown; wood hard, heavy, brittle, yellowish white, bitter and nearly odorless; bark smooth, grayish white mottled, relatively thick, reddish brown on the inner side; branchlets numerous, quite short, bendable; the twigs green, glabrous, angular and zigzag. Leaves subchartaceous, hanging, curvingly folded upon the upper green surface, glabrous, copious, alternately scattered, curing dull green on both sides, the basal margin entire, above the middle obscurely serrate, the serratures usually black callous pointed, acute at the apex, broadly obtuse or obtusely rounded at the base, oblong or subelliptic; the average lamina 1 dm long by 4 cm wide across the middle; petiole also glabrous, 5 to 8 mm long, yellowish brown when dry, deeply caniculate; midrib similar in color, smooth; lateral nerves much ascending and curved, 7 to 9 pairs, evident from above, prominent beneath, tips obscurely united, with fimbriate glands in the axils, otherwise glabrous, cross bars fine and obscure. Flowers fascicled from short thick tubercles in the axils of the fallen leaves; pedicels slender, unequal in length, the longest 1 cm long, glabrous, strict, spreading, subtended at the base by a series of very blunt bracts; calyx glabrous, shallowly cup shaped, imbricated and united at the base; segments 5, ovately elliptic, broadly obtuse at the apex, densely purplish spotted especially in the middle basal region, 2.25 mm

long, 1.25 mm wide toward the base; corolla erect, slightly imbricate, nearly free, as many as there are calyx segments, 3.5 mm long by 1.5 mm wide across the base, ovately elongated, glabrous, rounded at the apex, similarly spotted all over, sides more or less folded or rolled upon the ventral surface; staminal rim 0.5 mm wide, glabrous; stamens 10, erect; filaments 0.25 mm long, arising from the edge of the rim, also glabrous, 1.25 mm long, auriculately truncate at the base, flattened, dehiscing laterally, the connective expanded at the apex by a conspicuous purplish streaked and finely lacerated membrane; ovary 2.5 mm long, short ellipsoid, glabrous, bearing a terete 1 mm long striate style, about 4-ovuled. Fruit in axillary fascicles, ascending or divaricately spreading, upon green axillary tubercles usually provided with a series of small bracts; pedicels very slender, 1.5 cm long, glabrous, strict; capsule green, 3-seeded, shining, obscurely 3-angled, otherwise nearly globose, 1 cm long, terminated by a conspicuous point, subtended by the rotately spreading 5-lobed calyx rim and by the subsistent oblong petals, both the middle dorsal region of the calyx segments and the free petals cinereous.

Type specimen numbers 12724 and 12793, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected the first or flowering number in dry compact soil of light woods at 50 feet altitude. The latter or fruiting specimens were found in gravelly soil along wooded stream banks at 250 feet elevation.

This species and variety may more properly belong to *Euphorbiaceae* than to *Violaceae*.

***Viola apoense* Elm. n. sp.**

Annuals, more or less creeping by stolons or runners, occasionally forming patches; stolon slender, glabrous, straw brown on the dry specimens, greenish when fresh, up to 8 cm long; rootstock or underground stem suberect, 1 to 3 cm long, amply provided with fibrous roots. Leaves ascending, alternately clustered toward the distal ends of the rootstock, scattering in all directions; petioles very slender, varying from 1 to 3 cm long, somewhat compressed and winged

especially toward the blade, green toward the distal end even when dry, yellowish brown toward the subglabrous base, otherwise strigosely ciliate; stipular bracts apparently inter-axillary and more or less sheathing the stem or adnate to the petiole, few mm in length, the linear adnate stipules slenderly 1-toothed, the free oblongish axillary ones slenderly and pectinately toothed, yellowish brown, nearly glabrous; blade orbicular, 1 cm wide, with a broad cordate sinus at the base, crenate or only obscurely so, crisply strigose along the veins, otherwise glabrous, flat, membranous, paler green beneath; veins in the average lamina 5, the middle one straight and extending to the apex, with 1 lateral pair from the middle; the 2 basal lateral pairs arising from near the base and divaricately or obliquely spreading, all the lateral ones usually forked or branched toward the distal ends. The short stalked flowers near the rootstock bearing the crown of leaves, when in fruit slenderly stalked and horizontally spreading; peduncles usually solitary, arising from the axils of the basal leaves or branches, varying from 1 to 2 cm long, recurved at the distal end at least in the fruiting state, the middle portion light green and with hyaline margins, more or less compressed, sparsely ciliate, provided with a pair of bracts at about the middle; bracts 5 to 7 mm long, linear, 0.75 mm wide, apex pointed, with a green midrib, sides hyaline and similarly ciliate along the edges; calyx 3.5 to 4.25 mm long, at the base united into a disk-like expansion and each segment extended into a broadly rounded 1 mm long green and hyaline ciliate margined basal membrane; the free portion of the 5 segments 3.25 mm long, 1 mm wide at the base, gradually tapering from the base to the rather fine point, with 3 greenish parallel veins, otherwise hyaline and similarly ciliate along the margins, withering though subpersistent; corolla not seen. Capsule short, trigonous, ellipsoid, 3 mm long, also glabrous, pale green or whitish, loculicidally dehiscent from the apex clear down to the base; carpels much concavo-convex, terminated at the apex by a short incurved point, subpersistent, the partitions of the 3 cells not completely extending to the center; ovules several in each cell, brown, usually elliptic, somewhat compressed, 0.75 mm long,

usually congregated along the septae.

Type specimen number 11544, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Forming patches or solitary upon moss covered boulders strewn along the Cati creek at 5750 feet altitude or just above its first of a series of falls on the east or northeastern side of mount Apo. "Tasik" in Bagobo.

Apparently distinct from all other Philippine species of violets.

VITACEAE

Cissus apoensis Elm. n. sp.

A shrubby tree climber; leaf bearing branches 1 cm thick, subterete, densely castaneus hairy, young branches long and slender. Leaves opposite or tendril opposed, ascending or horizontal, well scattered; petiole almost 1 dm long, terete or nearly so, not so prominently ridged as the branches; leaflets 3, coriaceous, densely soft tomentose beneath, very short hairy above, the terminal one longer and symmetric, all abruptly terminated into a narrow and acuminate pointed apex, the terminal leaflet elliptic in outline, the lateral pair of leaflets inequilateral and broadly rounded at the base, 1.5 dm long at least by 12 cm wide, subentire around the base, otherwise coarsely and irregularly dentate, the lateral pair at the base oblique and occasionally a trifle cordate; lateral petiolule thick, 1 cm long, the terminal one twice as long, latericulus tomentose, flattened along the upper side, becoming easily detached; mid-vein straight to the apex, usually with 3 lateral basal veins on the broader and only 1 lateral basal vein on the narrower side, the 5 other lateral pairs of nerves ascendingly curved, the larger of the basal lateral nerves branched along the lower side, cross bars and few coarse reticulations comparatively obscure, becoming however more evident in the old leaves as the indumentum wears down or off entirely. Inflorescence along the slender twigs, opposed by a reduced leaf, 2 dm long, 3-branched toward the apex; peduncle terete, finely ridged, dark brown pubescent, fre-

quently articulated above the middle and with a pair of bracts; branchlets 5 to 8 cm long, compressed and grooved along the sides, easily separating at the base, distichously rebranched above the middle, the ultimate ones short and expanded at the point of branching; flowers odorless, greenish, usually few clustered from the more or less thickened distal end of the last branchlets, subglabrate; pedicel with the calyx 4 mm long, the basal 3 mm pedicel-like, more or less ridged toward the much broadened distal end, usually curved, puberulent; the calyx portion 3.5 mm wide, disk-like and 4-apiculate, rigid; corolla truncately conical and falling off as a hood, more or less angular, the basal one half portion thinner in texture and united though the 4 lobes usually separate from the base toward the apex, externally pulverulent below the middle, puberulent toward the apex, 4 mm long, the edges above the middle with conspicuous inwardly extending membranous wings, segments obtuse at the apex; stamens 4 or of an equal number as there are corolla and calyx segments, apparently opposite the petals; filaments 2.5 mm long, glabrous, much dilated at the base, curved or twisted especially at the apex; anther oblong, 1.33 mm long, basifixed, well encased by the petal margins, bilobed, laterally dehiscent; ovary much compressed, likewise glabrous, 3 mm thick, sunken across the truncate apex, sparsely glandular, obscurely 4-lobed, black and rugose around the outside; style erect, arising from the middle of the ovary, 1.5 mm long, terete, light yellow, occasionally gland punctate, thickest at the base, terminated by a small truncate stigma.

Type specimen number 11696, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Collected in damp forests at 4000 feet altitude along the trail to mount Apo. "Sumagisig" is the Bagobo name.

***Leea agusanensis* Elm. n. sp.**

Lax undershrub; stem 1.5 to 2 cm thick, crooked, 2 or even 3 m high or long, usually inclining, very sparingly branched toward the top, glabrous, obscurely striate and brown lenticelled, ater when dry. Leaves few, alternating

toward the ends of the stem and branches, horizontal, subcoriaceous, the upper one about 4 dm long, 5 to 7-foliate, imparipinnate; petiole 6 cm long, subterete, dull green and ater when dry, obscurely striate, in the early state puberulent or finely scurfy, the rachis a trifle angular and extended beyond the upper pair of the leaflets, otherwise similar in color and vestiture; the terminal leaflet largest, the basal pair either much reduced in size or only a little smaller than the upper pairs, elongated, the average blades 7 cm wide across the middle or widest portion, both ends obtuse at the base, acute to acuminate pointed at the apex, entire toward the base, otherwise dentate or serrately toothed especially toward the apex, curing lighter brown beneath, the upper nearly flat side very dark green in the natural state; petiolule of the lateral leaflets 5 mm long, those of the terminal leaflet longer, thick, distinctly channeled along the upper side, similar in color when fresh and when dry to that of the rachis, ultimately glabrate; midrib ridged beneath, even a trifle raised along the upper side, also glabrous and dull brown in the dry state; lateral nerves 10 to 12 pairs, oblique, much less prominent beneath yet plainly marked along the upper side, tips ascendingly curved and usually terminating in the marginal teeth; cross bars very numerous, fine, plainly visible on the nether side. Inflorescence lateral on our type or between the uppermost developed leaf and the apical young leaf, 5 cm across, 3-branched from near the base; peduncle proper 3 to 5 mm long, fulvus hairy, relatively very thick, subtended by a caducous rim-like more or less brown hairy involucre bract; main branches similarly pubescent, the lateral longer and nearly at right angles, rebranched from above the middle; ultimate branches thick, angular, short, fulvus pubescent, also subtended by caducous bract vestiges, bearing a small cluster of flowers toward their distal ends; pedicel 1 to 3 mm long, brown, puberulent, subtended by bracteoles; calyx 6 mm long including the 2.5 mm long stipitate base, obscurely angular, glabrate or pulverulent, the calyx proper deeply campanulate, 3 mm wide across the 4-toothed apex; segments ovately oblong, rounded at the apex, subcoriaceous, usually recurved; corolla 5 mm long, parted into 5 lobes,

turbinate and united below the middle, glabrous but finely punctate on the dorsal side; segments valvate in the bud state, coriaceous, broadly oblong, obtuse at the apex, one half the length of the entire corolla, alternating with the calyx series, the apex thickened upon the ventral side, rotately spreading; stamens 4, erect, in the young state united with the basal portion of the corolla; staminal tube erect, fleshy, glabrous, at least 3 mm long, relatively very thick, the quarters notched at the apex; filaments compressed, inserted at the basal outer side of the staminal tube, rather slender, glabrous, closely appressed and extending over the apical sinus of the staminal tube, spreading in anthesis; anther reflexed into the staminal tube before and reversed after anthesis, basifixed, connective pointed at the apex, oblong, subterete, 2 mm long, dehiscing laterally; cells thin, introrse in the bud state, extrorse subsequently; imbedded ovary globose, 1 mm in diameter, glabrous; style with capitate stigma 3 mm long, both glabrous and fleshy. Fruits upon much elongated and somewhat thickened lenticelled stalks, 1.5 cm thick, globosely compressed and roundly 4-lobulate, glabrous, normally 4-seeded, otherwise rather succulent and soft when mature; seeds stone-like, 6 mm in diameter, subglobose.

Type specimen number 13500, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Discovered in wet poor or stony ground along a streamlet coursing through the densely humid *Dipterocarpaceae* forested flat at 750 feet above sea level. "Mamali" in Manobo.

Manifestly nearest related to my *Leea congesta* of Luzon yet there are a number of good specific differences.